

Executive Summary

The California Department of Water Resources (DWR), U.S. Department of the Interior (DOI) Bureau of Reclamation (Reclamation), U.S. Fish and Wildlife Service (USFWS), and National Marine Fisheries Service (NMFS) have prepared a joint Environmental Impact Report (EIR) and Environmental Impact Statement (EIS) for the Bay Delta Conservation Plan (BDCP or Plan), a habitat conservation plan (HCP)/natural community conservation plan (NCCP). The EIR/EIS has been prepared pursuant to the California Environmental Quality Act (CEQA) (Public Resources Code Sections 21000–21178.1) and the State CEQA Guidelines; the National Environmental Policy Act (NEPA) (42 United States Code [USC] 4321; 40 Code of Federal Regulations [CFR] 1500.1); and the President’s Council on Environmental Quality (CEQ), DOI (43 CFR Part 46), and NMFS (NOAA Administrative Order 216-6) regulations for implementing NEPA.

The BDCP proponents—DWR and six State Water Project (SWP) and Central Valley Project (CVP) water contractors¹—are applying for incidental take permits (ITPs) from USFWS and NMFS, pursuant to Section 10(a)(1)(B) of the federal Endangered Species Act (ESA) and incidental take authorization by the California Department of Fish and Wildlife (DFW), pursuant to California Fish and Game Code Section 2835. The permits would authorize take² of certain state- and federally listed species, fully protected species, and some nonlisted species (collectively, *covered species*) during the course of otherwise lawful activities (i.e., covered activities). The BDCP EIR/EIS has been prepared for the purpose of analyzing and disclosing the potential environmental effects and effects on the human environment associated with the alternatives and to identify potentially feasible ways to avoid, minimize, or mitigate adverse effects.

The BDCP has been prepared as a required component of the application for the ITPs/NCCP permit, and to support the issuance of these permits for a term of 50 years. The BDCP is a comprehensive conservation strategy for the Sacramento–San Joaquin Delta (Delta) to advance the planning goal of restoring ecological functions of the Delta and improving water supply reliability in the state of California. The conservation strategy is designed to restore and protect ecosystem health, water supply, and water quality within a stable regulatory framework. The BDCP reflects the outcome of a multiyear collaboration between DWR, Reclamation, state and federal fish and wildlife agencies, state and federal water contractors, nongovernmental organizations, agricultural interests, and the general public. The BDCP sets out a comprehensive conservation strategy for the Delta designed to restore and protect ecosystem health, water supply, and water quality within a stable regulatory framework through the following.

- New and/or modified state water conveyance facilities and operation of the SWP and the CVP in the Delta.
- Conservation through the protection, restoration, and enhancement of habitats for native fish, wildlife, and plants within the Delta.

¹ The BDCP proponents include the following SWP or CVP contractors: Alameda County Flood Control and Water Conservation District, Zone 7; Kern County Water Agency; Metropolitan Water District of Southern California; San Luis & Delta-Mendota Water Authority; Santa Clara Valley Water District; and Westlands Water District. Additional water contractors may become BDCP proponents in the future through the BDCP process.

² The broad definition of “take” under the ESA includes actions that harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct (16 USC 1532[19]).

- Actions to address other ecological stressors to covered aquatic species in the Delta.
- Adaptive management of water conveyance facilities operations; the protection, restoration and enhancement of habitats; and measures to reduce other ecological stressors.

The BDCP provides a comprehensive conservation strategy to meet a series of broad planning goals and a range of specific biological goals and objectives. The BDCP includes a description of each element of the conservation strategy and the rationale for its inclusion. The BDCP further describes the expected contribution of each Plan element toward advancing both the overall planning goals and specific biological goals and objectives. The conservation strategy was informed by the collective experiences of professionals working in the Delta over the course of several decades, monitoring results and conceptual models developed over time through prior scientific efforts (e.g., those conducted by the California Bay-Delta Authority [CALFED] Science Program), and supplemented by data and analysis developed through the BDCP process. The conservation strategy is based on the best available science and was built upon the following broad conservation goals.

- Increase the value, availability, spatial diversity, and complexity of aquatic habitat in the Delta.
- Create new opportunities to restore the ecological health of the Delta by modifying the water conveyance infrastructure.
- Directly address key ecosystem drivers in addition to freshwater flow patterns rather than manipulation of Delta flow patterns alone.
- Improve connectivity among aquatic habitats; facilitate migration and movement of covered fish among habitats; and provide transport flows for the dispersal of planktonic material (organic carbon), phytoplankton, zooplankton, macroinvertebrates, fish eggs, and larvae.
- Improve synchrony between environmental cues and conditions and the life history of sensitive fish species and their food resources in the upstream rivers, Delta, and Suisun Bay, including seasonal water temperature gradients, salinity gradients, turbidity, and other environmental cues.
- Reduce sources of mortality and other stressors on the covered fish and the aquatic ecosystem in the Delta.
- Improve habitat conditions for covered fish in the Delta and downstream in the low-salinity zone of the estuary in Suisun Bay through the integration of water operations with physical habitat enhancement and restoration.
- Avoid, minimize, and mitigate adverse effects on terrestrial wildlife and plants resulting from implementation of measures to benefit aquatic species.
- Expand the extent and enhance the functions of existing natural communities and habitat of covered wildlife and plants that are permanently protected.
- Restore habitat to expand the populations and distributions of covered wildlife and plant species.
- Emphasize natural physical habitat and biological processes to support and maintain species covered by the Plan (i.e., covered species) and their habitat.

ES.1 Introduction

The BDCP EIR/EIS³ evaluates and discloses the potential impacts associated with the BDCP action and no action alternatives, and proposed issuance of take permits. Impacts on human, physical, and biological resource areas (see Section ES.8.1 for a list of resource areas/topics included in the evaluation) are presented in the document. The evaluation includes site-specific mitigation for construction and operation of proposed water conveyance facilities, although additional site-specific environmental documents will likely be required for implementation of some conservation measures (related to habitat restoration, protection, and enhancement, as well as those actions intended to reduce the effects of other stressors). Additional information and/or documentation may be necessary during consideration of related permit applications and decision-making processes.

Like the EIR/EIS, the BDCP (described in Section ES.4, *Proposed BDCP*) provides an analysis of the effects of implementing the Plan. Specifically, the BDCP Effects Analysis (BDCP EA) describes how construction, operation, and maintenance of the proposed water conveyance facilities, ecosystem restoration, and other BDCP covered activities will affect ecosystems, natural communities, and covered species. The BDCP presents specific information and analyses needed by the state and federal fish and wildlife agencies to issue ITPs/NCCP permit, or authorization for the take of covered species as a result of implementing the proposed BDCP. Accordingly, the focus of the BDCP EA is on potential Plan effects on covered species and their habitats from construction, operation, and maintenance of new and existing water conveyance facilities, ecosystem restoration actions, and other covered actions as described in the BDCP. These analyses contained in the BDCP EA are utilized, as relevant, in the EIR/EIS evaluations for the potential effects of BDCP implementation on fish and aquatic resources and terrestrial resources. In addition, the EIR/EIS addresses noncovered species and resource topics (see Section ES.8.1, *Resource Areas*) not considered in the BDCP EA as well as various alternatives to the proposed BDCP (see Section ES.5, *Alternatives Considered in the EIR/EIS*).

The following sections provide an overview of the intended uses of the EIR/EIS, describe the various agencies' roles and responsibilities, and provide an overview of the BDCP approval process.

ES.1.1 Intended Uses of the BDCP EIR/EIS and Agency Roles and Responsibilities

The BDCP EIR/EIS is intended to meet the requirements of CEQA and NEPA, provide sufficient analysis to support BDCP decision making, and to inform permit decisions for the issuance of the ITPs/NCCP permit. Before the selection and approval of one of the BDCP alternatives considered in the EIR/EIS, the lead agencies must comply with the necessary state and federal environmental review requirements. The goal of the EIR/EIS is also to provide sufficient evaluation of alternatives so that project-level assessment of the potential effects of selected modified and/or new conveyance facilities (Conservation Measure 1 [CM1]) is possible. For BDCP CM2–CM22, the EIR/EIS intends to present a program-level analysis consistent with the level of detail provided in the BDCP. Therefore, for CM2–CM22, the potential exists for additional CEQA/NEPA environmental review and associated permit actions to be required prior to implementing these conservation measures.

³ The full BDCP EIR/EIS should be understood to include not only the EIR/EIS and its appendices but also the proposed BDCP documentation including all related appendices.

CEQA requires preparation of an EIR when there is substantial evidence in light of the whole record that an agency action, such as approval and implementation of the BDCP, may have a significant impact on the environment. An EIR is a document that discloses and analyzes the potential environmental effects of a project and discusses ways to mitigate or avoid significant effects. A *program EIR* may be prepared on a series of actions that can be characterized as one large project, such as for an NCCP (State CEQA Guidelines Section 15168). A program EIR generally establishes a framework for subsequent *tiered* or project-level environmental documents that are prepared in accordance with a program. The degree of specificity in a program EIR's impact analysis need only be as detailed as the description of the elements in the program (State CEQA Guidelines Section 15146). A *project EIR*, in contrast, analyzes and discloses the environmental impacts of a specific development project. A project EIR typically examines all aspects of a project, including construction and operation and maintenance, at a greater level of detail than a program EIR. An EIR may include both program and project elements.

NEPA and the CEQ's regulations for implementing NEPA (40 CFR 1502.14) require federal agencies to prepare an EIS for major federal actions that could significantly affect the quality of the human environment.

The EIS must rigorously explore and objectively evaluate (CEQ 40 questions) the environmental effects of an action, including a range of reasonable alternatives, and identify mitigation measures to minimize adverse effects for the range of impacts of the proposal when they propose to carry out, approve, or fund a project that may have a significant effect on the environment. [T]o ensure environmental effects of a proposed action are fairly assessed, the probability of the mitigation measures being implemented must also be discussed and the EIS and Record of Decision should indicate the likelihood that such measures will be adopted or enforced, and when they might be available (40 CFR 1502.16[h] and 1505.2).

A *programmatic EIS* under CEQ regulations for implementing NEPA (40 CFR 1500.4[i], 1502.4[b] and [c], 1502.20) may be prepared to analyze broad-scope actions such as the adoption of new agency programs or regulations. The programmatic EIS addresses the broad issues relating to a project, and additional environmental documentation for project-specific impacts are prepared when necessary. Subsequent analysis of more specific proposals is generally required under NEPA, and information from a programmatic EIS can be referenced (tiered) in the subsequent NEPA document to reduce redundancy. Like that in a project EIR, the effects analysis in a project EIS generally focuses on a specific facility or activity, and is done at a greater level of detail. Like EIRs, an EIS can contain both programmatic and project-level elements.

Accordingly, this BDCP EIR/EIS intends to provide both program- and project-level analyses, which in total intend to provide a sufficient level of detail to comply with NEPA and allow USFWS and NMFS to make an informed decision on their action of considering issuance of an ITP under Section 10 of the ESA. Similarly, this document is intended to provide sufficient level of detail to comply with CEQA to allow for approval of the BDCP as an NCCP by CDFW under the Natural Community Conservation Planning Act (NCCPA). Specifically, the EIR/EIS is intended to provide a project-level assessment of the potential effects of modified and/or new water conveyance facilities and existing facility operational changes (CM1), including project-specific mitigation, and SWP water supply contract amendments and/or funding agreements. Design information for CM1 is available at a project level. Although the EIR/EIS is intended to provide sufficient NEPA coverage for ESA permitting actions by USFWS and NMFS, the U.S. Army Corps of Engineers (USACE), in considering whether to grant "fill permits" under the Clean Water Act, may require additional analyses for NEPA and other permitting necessary for the component pieces of CM1 that affect federally protected

wetlands. CM2–CM22 include restoration and conservation strategies for aquatic and terrestrial habitat and other stressor reduction measures and are currently presented at a conceptual level. Because the design information is currently at a conceptual level of detail, the EIR/EIS provides a program-level analysis of the potential effects that may occur as a result of implementing these conservation measures. Consequently, although USFWS, NMFS, and CDFW may approve and issue permits under the BDCP based on the EIR/EIS, other authorizations by agencies subject to NEPA and CEQA necessary to implement CM2–CM22 may not be obtained until a later date, when more detailed design information is available. At this later time, it will be determined whether a more focused, project-level environmental review is required.

ES.1.1.1 Overview of BDCP Approval Process

In addition to the BDCP proponents, the BDCP is being prepared with the participation of Reclamation, USFWS, NMFS, USACE, the California Natural Resources Agency, CDFW, the State Water Resources Control Board (State Water Board), and various stakeholders. These organizations are helping to guide the preparation of the BDCP. The regulatory agencies—USFWS, NMFS, CDFW, USACE, and the State Water Board—are participating to provide technical input and guidance in support of planning efforts to complete the BDCP. USFWS and NMFS are also NEPA lead agencies with Reclamation. The NEPA lead agencies are working with federal (e.g., USACE and the U.S. Environmental Protection Agency [EPA]) and non-federal (e.g., several Delta counties, North Delta Water Agency, and several reclamation districts) cooperating agencies, DWR (CEQA lead agency), and CEQA responsible agencies (e.g., CDFW, State Water Board) to prepare this EIR/EIS.

Table ES-1 identifies the lead, cooperating, responsible, and trustee agencies that will use the EIR/EIS as part of their decision-making process. Other potential responsible agencies may also utilize this analysis for discretionary approvals.

The BDCP is intended to secure those authorizations that would allow for the actions set out in the BDCP—restoration and protection of ecosystem health, water supply, and water quality—to proceed within a stable regulatory framework. The BDCP proponents have developed a plan that will be submitted to USFWS and NMFS as an HCP under the provisions of ESA Section 10(a)(1)(B) and to CDFW as an NCCP under California Fish and Game Code Sections 2800 et seq. The BDCP EIR/EIS is also intended to inform the associated biological assessment and ESA Section 7 consultations, and provide other appropriate information to make a decision on selecting which alternative to implement regarding approval of the BDCP and issuance of the ITPs/NCCP permit.

As previously indicated, the BDCP proponents will apply for take authorizations under ESA Section 10 (a)(1)(B) and Section 2835 of the California Fish and Game Code for BDCP covered activities. ESA and the California Endangered Species Act (CESA) prohibit the take of endangered or threatened species. The ITPs/NCCP permit will establish a specified level of allowable incidental take⁴ for BDCP covered species. BDCP covered activities include operations for transport and delivery of water, construction of new water conveyance infrastructure and other facilities, maintenance and monitoring of that infrastructure, and impacts associated with implementation of the other conservation measures in the BDCP conservation strategy (Section ES.4.3, *Covered Activities*).

⁴ *Incidental take* of threatened and endangered species occurs when such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity (16 USC 1539[a][1][B]).

Table ES-1. Lead, Cooperating, Responsible and Trustee Agencies

| Agency | Role |
|---|---------------------------------|
| Lead Agencies | |
| California Department of Water Resources | CEQA lead agency |
| U.S. Bureau of Reclamation | NEPA lead agency |
| U.S. Fish and Wildlife Service | NEPA lead agency |
| National Marine Fisheries Service | NEPA lead agency |
| Cooperating Agencies | |
| U.S. Army Corps of Engineers | NEPA Federal cooperating agency |
| U.S. Environmental Protection Agency | NEPA Federal cooperating agency |
| State and Federal Contractors Water Agency | NEPA cooperating agency |
| Contra Costa County | NEPA cooperating agency |
| Sacramento County | NEPA cooperating agency |
| Solano County | NEPA cooperating agency |
| Yolo County | NEPA cooperating agency |
| Reclamation District 999 | NEPA cooperating agency |
| Reclamation District 150 | NEPA cooperating agency |
| Reclamation District 551 | NEPA cooperating agency |
| Reclamation District 3 | NEPA cooperating agency |
| North Delta Water Agency | NEPA cooperating agency |
| Responsible Agencies | |
| California Department of Fish and Wildlife | CEQA responsible agency |
| California Department of Transportation | CEQA responsible agency |
| State Water Resources Control Board | CEQA responsible agency |
| Delta Stewardship Council | CEQA responsible agency |
| Trustee Agencies | |
| California Department of Fish and Wildlife | CEQA trustee agency |
| California State Lands Commission | CEQA trustee agency |
| California Department of Parks and Recreation | CEQA trustee agency |

ES.1.1.1.1 State Agency Actions

DWR operates and maintains the SWP and would continue to do so as part of the implementation of CM1 related to the SWP. DWR's actions will be to certify the EIR, adopt findings of fact, decide whether to approve the BDCP and its implementation, and carry out obligations under the BDCP. DWR would also be involved in any discretionary action related to coordination with Reclamation or SWP contractors. CDFW is considering whether to approve the BDCP as an NCCP and issue permits under Section 2835 of the California Fish and Game Code.

ES.1.1.1.2 Federal Agency Actions

USFWS and NMFS will make a decision regarding the issuance of ITPs for the incidental take of federally listed species (included in Table ES-2) from the construction, operation, and maintenance associated with water conveyance, ecosystem restoration, and other covered activities. The

applicant's proposed duration of the ITPs is 50 years. USFWS and NMFS would issue separate ITPs covering species under their respective authorities. This EIR/EIS and the alternatives analyzed here or screened from further analysis, as well as the intraservice consultation under ESA Section 7, will provide USFWS and NMFS with information to assist in making permit issuance decisions under ESA Section 10(a)(1)(B) and implementing regulations.

Reclamation operates the CVP in coordination with the SWP through the Coordinated Operation Agreement (COA), which was entered into at the direction of Congress by the United States of America and the State of California in November 1986. Operation of new conveyance facilities and/or flow patterns proposed under the BDCP would result in changes to existing CVP operations specific to the Delta that provide for diversion, storage, and conveyance of CVP water consistent with applicable law and contractual obligations. Reclamation's action in relation to the BDCP would be to adjust CVP operations specific to the Delta to accommodate new conveyance facility operations and/or flow requirements under the BDCP, in coordination with SWP operations.

ES.1.1.2 Use of the EIR/EIS by Other Entities

Implementation of the BDCP will require permits and approvals from public agencies other than the lead agencies. These other public agencies are referred to as responsible agencies and trustee agencies under CEQA (State CEQA Guidelines Sections 15381 and 15386) and cooperating agencies under NEPA (e.g., USACE, EPA).

As described in CEQ's NEPA regulations (40 CFR 1501.6), federal agencies other than the NEPA lead agency that have jurisdiction by law or special expertise with respect to the environmental effects anticipated from the project can be included as cooperating agencies. A cooperating agency participates in the NEPA process and may provide input (i.e., expertise) during preparation of the NEPA document. Federal agencies may designate and encourage nonfederal public agencies, such as state, local, and tribal agencies that meet the same criteria as federal cooperating agencies, to participate in the NEPA process as cooperating agencies (40 CFR 1508.5). Additionally, other federal and state agencies may contribute to and rely on information prepared as part of the environmental compliance process for the BDCP, including the EIR/EIS and supporting materials.

ES.2 Project Objectives/Purpose and Need

The CEQA project objectives are important to document the reasons the BDCP proponents are undertaking the proposal and what objectives they intend to achieve by that proposal. NEPA requires that an EIS include a statement of "purpose and need" to which the federal agency is responding in proposing the alternatives, including the proposed action (40 CFR 1502.13). The project objectives and purpose and need statement are the starting points for the state and federal agencies in developing the reasonable range of alternatives to be evaluated in detail in the EIR/EIS (State CEQA Guidelines Sections 15124[b], 15126.6[a]); 40 CFR 1502.13).

The following sections present the Project Objectives for the BDCP in compliance with the requirements of CEQA and the Project Purpose and Project Need for the BDCP in compliance with the requirements of NEPA.

ES.2.1 Project Objectives

CEQA requires an EIR to contain a statement of the objectives of the project proponents in proposing the project and alternatives. DWR's fundamental purpose in proposing the BDCP is to make physical and operational improvements to the SWP system in the Delta necessary to restore and protect ecosystem health, water supplies of the SWP and CVP south-of-Delta, and water quality within a stable regulatory framework, consistent with statutory and contractual obligations. The intent of the BDCP proponents is to formulate a plan that could ultimately be approved by USFWS and NMFS as an HCP under the provisions of ESA Section 10(a)(1)(B) and by CDFW as an NCCP under California Fish and Game Code Sections 2800 et seq.

The fundamental purpose is informed by past efforts taken within the Delta and the watersheds of the Sacramento and San Joaquin Rivers, including those undertaken through the CALFED Program and Delta Risk Management Strategy. The fundamental purpose, in turn, gives rise to the following project objectives, which were presented in the Notice of Preparation (NOP) for the BDCP EIR/EIS.

- Respond to the applications for ITPs⁵ for the covered species that authorize take related to the following.
 - The operation of existing SWP Delta facilities and construction and operation of facilities for the movement of water entering the Delta from the Sacramento Valley watershed to the existing SWP and CVP pumping plants located in the southern Delta.
 - The implementation of any conservation actions that have the potential to result in take of species that are or may become listed under the ESA, pursuant to the ESA at Section 10(a)(1)(B) and its implementing regulations and policies.
 - The diversion and discharge of water by Mirant LLC for power generation in the Western Delta⁶.
- To improve the ecosystem of the Delta by the following.
 - Providing for the conservation and management of covered species through actions within the BDCP Plan Area that will contribute to the recovery of the species.
 - Protecting, restoring, and enhancing certain aquatic, riparian, and associated terrestrial natural communities and ecosystems.
 - Reducing the adverse effects on certain listed species of diverting water by relocating the intakes of the SWP and CVP⁷.
- Restore and protect the ability of the SWP and CVP to deliver up to full contract amounts, when hydrologic conditions result in the availability of sufficient water, consistent with the requirements of state and federal law and the terms and conditions of water delivery contracts and other existing applicable agreements.

⁵ In this instance, ITPs should also be understood to include the NCCP permit for the purposes of CDFW.

⁶ Since publication of the NOP, Mirant LLC is no longer an active participant in the BDCP.

⁷ Subsequent to publication of the NOP, this was revised to refer to adding additional intakes, instead of relocating intakes.

In addition to the project objectives enumerated above, the following additional project objectives guide the development of the proposed project and alternatives.

- To ensure that the BDCP meets the standards for an NCCP by, among other things, protecting, restoring, and enhancing aquatic and terrestrial natural communities and ecosystems that support covered species within the Plan Area.
- To make physical improvements to the conveyance system in anticipation of rising sea levels and other reasonably foreseeable consequences of climate change.
- To make physical improvements to the conveyance system that will minimize the potential for public health and safety impacts resulting from a major earthquake that causes breaching of Delta levees and the inundation of brackish water into the areas in which the SWP and CVP pumping plants operate in the southern Delta.
- To develop projects that restore and protect water supply and ecosystem health and reduce other stressors on the ecological functions of the Delta in a manner that creates a stable regulatory framework under the ESA and NCCPA.
- To identify new operations and a new configuration for conveyance of water entering the Delta from the Sacramento River watershed to the existing SWP and CVP pumping plants in the southern Delta by considering conveyance options in the north Delta that can reliably deliver water at costs that are not so high as to preclude, and in amounts that are sufficient to support, the financing of the investments necessary to fund construction and operation of facilities and/or improvements.

ES.2.2 Project Purpose and Need

NEPA requires an EIS to briefly describe the underlying purpose and need for the federal lead agency's action, as well as alternatives to the proposed action, including the no action alternative. The project purpose and project need described below are consistent with the project objectives identified in Section ES.2.1.

ES.2.2.1 Project Purpose

The purposes of the proposed actions under the BDCP are to achieve the following.

1. Consider the applications for ITPs⁸ for the covered species that authorize take related to the actions listed below.
 - a. The operation of existing SWP Delta facilities.
 - b. The construction and operation of facilities and/or improvements for the movement of water entering the Delta from the Sacramento Valley watershed to the existing SWP and CVP pumping plants located in the southern Delta.
 - c. The implementation of any conservation actions that have the potential to result in take of species that are or may become listed under the ESA, pursuant to ESA Section 10(a)(1)(B) and its implementing regulations and policies.

⁸ In this instance, ITPs should also be understood to include the NCCP permit for the purposes of CDFW.

2. Improve the ecosystem of the Delta by implementing the actions listed below.
 - a. Providing for the conservation and management of covered species through actions within the BDCP Plan Area that will contribute to the recovery of the species.
 - b. Protecting, restoring, and enhancing certain aquatic, riparian, and associated terrestrial natural communities and ecosystems.
 - c. Reducing the adverse effects on certain listed species due to diverting water.
3. Restore and protect the ability of the SWP and CVP to deliver up to full contract amounts, when hydrologic conditions result in the availability of sufficient water, consistent with the requirements of state and federal law and the terms and conditions of water delivery contracts held by SWP contractors and certain members of San Luis Delta Mendota Water Authority, and other existing applicable agreements.

The above Purpose Statement reflects the intent to advance the coequal goals set forth in the Sacramento–San Joaquin Delta Reform Act of 2009 (Delta Reform Act) of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. The above phrase—*restore and protect the ability of the SWP and CVP to deliver up to full contract amounts*—is related to the upper limit of legal CVP and SWP contractual water amounts and delineates an upper bound for development of EIR/EIS alternatives, not a target. It is not intended to imply that increased quantities of water will be delivered under the BDCP. As indicated by the “up to full contract amounts” phrase, alternatives need not be capable of delivering full contract amounts on average in order to meet the project purposes. Alternatives that depict design capacities or operational parameters that would result in deliveries of less than full contract amounts are consistent with this purpose.

ES.2.2.2 Project Need

The need for the action is derived from the multiple, and sometimes conflicting, challenges currently faced within the Delta. The Delta has long been an important resource for California, providing municipal, industrial, agricultural, and recreational uses; fish and wildlife habitat; and water supply for large portions of the state. However, by several key criteria, the Delta is now widely perceived to be in crisis. There is an urgent need to improve the conditions for threatened and endangered fish species within the Delta. Improvements to the water supply conveyance system are needed to respond to increased demands upon and risks to the aquatic ecosystem, water supply reliability, and water quality.

ES.2.2.2.1 Delta Ecosystem Health and Productivity

Prior to the 1840s, variability in the location and timing of flows, salinity, and habitat was common in the Delta. But for the past 70 years, the Delta has been managed as a tidal/freshwater system. During this same period, the ecological productivity for Delta native species and their habitats has been in decline. Removal of the mix of fresh- and brackish-water habitats has had a limiting effect on the diversity of native habitat within the Delta. In addition, urban development, large upstream dams and storage reservoirs, water diversions, hydraulic mining, and the development of a managed network of navigation, flood control, and irrigation canals have all affected water flow patterns and altered fish and wildlife habitat availability. These changes, coupled with higher water exports, declines in water quality from urban and agricultural discharges, and changes in the dilution

capacity from managed inflows and diversions, have led to a decline in ecological productivity in the Delta.

ES.2.2.2.2 Water Supply Reliability

The distribution of precipitation and water demand in California is unbalanced. Most of the state's precipitation falls in the north, yet there is substantial water demand south and west of the Delta for irrigation water for southern Central Valley agriculture and for municipal and industrial uses in southern California and the Bay Area. This supply and demand imbalance led to development of two major water projects: the SWP and the CVP.

The SWP and CVP systems are two of the largest and most complex water projects in the nation, and they provide the infrastructure for the movement of water throughout much of California. They function under a suite of Congressional authorizations, interagency agreements, regulatory requirements, and contractual obligations that govern daily operations and seasonal performance. These include various authorizing legislation, the USFWS and NMFS Biological Opinions (BiOps), including the Reasonable and Prudent Alternatives, and the water right permits issued by the State Water Board, among others. Regulations for the combined SWP and CVP operations are intended to protect the beneficial uses of Delta water. These beneficial uses include municipal, industrial, and agricultural water uses; fish and wildlife uses; environmental protection; flood management; navigation; water quality; power; and recreation.

The water rights of the SWP and CVP are conditioned by the State Water Board to protect the beneficial uses of water within the Delta under each respective project's water rights. In addition, under the COA, SWP- and CVP-coordinated reservoir releases and Delta exports enable each water project to achieve benefit from their water supplies and to operate in a manner protective of beneficial uses. It is the responsibility of the SWP and CVP to meet these beneficial uses regardless of hydrologic conditions.

In 2006, Executive Order S-17-06 created the Delta Vision Task Force to address some of the issues facing the Delta. In the closing days of the Task Force's work, the State Water Board presented information indicating that quantities totaling several times the average annual unimpaired flows in the Delta watershed could be available to water users based on the face value of water permits already issued. However, existing hydrologies, SWP and CVP water contracts, and environmental regulations control actual quantities that could be made available for use and diversion.

The current and projected future inability of the SWP and CVP to deliver water to meet the demands of certain south-of-Delta SWP and CVP water contractors—in all water year types and considering ecosystem and species requirements—is a very real concern. More specifically, there is an overall declining ability to meet defined water supply delivery volumes and water quality criteria to support water users' needs for human consumption, manufacturing uses, recreation, and crop irrigation.

ES.2.2.2.3 Delta Hydrology and Water Quality

Generally, Delta hydrodynamics are defined by complex interactions between tributary inflows, tides, in-Delta diversions, and SWP and CVP operations. The degree to which each variable affects the overall hydrology of the Delta varies daily, seasonally, and annually, depending on the magnitude of inflows, the tidal cycle, and the extent of pumping occurring at the SWP and CVP facilities.

Changes in Delta inflow and outflow affect Delta water quality, particularly with regard to salinity. Additionally, other water constituents of concern in the Delta (e.g., mercury, selenium, polychlorinated biphenyls [PCBs]) have been identified through ongoing regulatory, monitoring, and environmental planning processes.

To further compound these challenges, fundamental changes to the Delta are certain to occur; the Delta is not a static ecological system. The anticipated effects of climate change will result in elevated sea levels, altered annual and interannual hydrologic cycles, changed salinity and water temperature regimes in and around the Delta, and accelerated shifts in species composition and distribution. These changes add to the difficulty of resolving the increasingly intensifying conflict between the ecological needs of a range of at-risk Delta species and natural communities and the need to provide adequate and reliable water supplies for people, communities, agriculture, and industry. Anticipating, preparing for, and adapting to these changes are key underlying drivers for the BDCP.

ES.3 Project Area

The project area for the actions evaluated in the EIR/EIS is larger than the proposed BDCP Plan Area because some of the effects of implementing the BDCP or its alternatives would extend beyond the boundaries of this region. The project area consists of the following three geographic regions, as shown in Figure ES-1 and described in the following sections.

- Delta Region (Plan Area) is distinct from the larger Delta region considered for some resource areas in the impact analyses, and consists generally of the statutory Delta, the Yolo Bypass north of the statutory Delta, and Suisun Marsh, as well as the Areas of Additional Analysis⁹, which apply to several EIR/EIS alternatives).
- Upstream of the Delta region.
- SWP and CVP Export Service Areas.

ES.3.1 Delta Region (Plan Area)

The Plan Area includes the aquatic and terrestrial ecosystems and natural communities and adjacent riparian and floodplain natural communities within the statutory Delta (as defined in Water Code Section 12220), as well as the Suisun Marsh and the Yolo Bypass north of the statutory Delta. The statutory Delta includes parts of Yolo, Solano, Contra Costa, San Joaquin, and Sacramento Counties. The implementation of conservation measures for all action alternatives would most likely entail actions within and outside the statutory Delta, including in the Suisun Marsh, Suisun Bay, and the Yolo Bypass. Any conservation actions outside the statutory Delta would be implemented pursuant to cooperative agreements or similar mechanisms with local agencies, interested nongovernmental organizations, landowners, and others.

For the purposes of the EIR/EIS, the Delta Region—or Plan Area and Areas of Additional Analysis (Figure ES-2)—encompasses the statutory Delta, as well as the areas where CM1–CM22 would be

⁹ The Areas of Additional Analysis are two areas outside the defined Plan Area that encompass power transmission corridors. One area lies west of the Plan Area and is considered in analysis of proposed alternatives that include the west alignment (Alternatives 1C, 2C, and 6C). The other area lies east of the Plan Area and represents one of two potential transmission line alignments for Alternative 4.

implemented outside the statutory Delta. The Areas of Additional Analysis are two areas outside the defined Plan Area that encompass power transmission corridors. All the water conveyance features that would be constructed as part of CM1, including new intake facilities, would be located within the Delta region.

ES.3.2 Upstream of the Delta Region

The Upstream of the Delta region comprises those areas in the SWP and CVP system upstream of the Delta. Operational changes at SWP facilities in these areas may be necessary to move fresh water through and/or around the Delta consistent with operations of CM1.

ES.3.3 SWP and CVP Export Service Areas

The SWP and CVP Export Service Areas region includes water supply delivery infrastructure that may be affected by implementation of CM1 under all the alternatives. DWR has long-term water supply contracts with 29 agencies and districts to provide water from the SWP, and Reclamation has long-term contracts with approximately 250 water districts, irrigation districts, and others for delivery of CVP water.

ES.4 Proposed BDCP

As previously described, the BDCP is a joint HCP/NCCP intended to address ESA and NCCPA compliance for operation of the existing SWP Delta facilities and for the construction and operation of conveyance facilities for the movement of water entering the Delta from the Sacramento Valley watershed to the existing SWP and CVP pumping plants in the south Delta. The BDCP is also proposed to provide for the conservation and management of covered species through a conservation strategy that includes biological goals and objectives; conservation measures, including the construction and operation of new Delta water conveyance facilities, within the Plan Area and the Areas of Additional Analysis; avoidance and minimization measures; and a monitoring, research, and adaptive management program.

The following sections provide a brief description of HCPs and NCCPs in general; identify the BDCP covered species and covered activities, including brief descriptions of BDCP conservation measures; describe the BDCP's biological goals and objectives; and present the proposed implementation schedule.

ES.4.1 Habitat Conservation Plans/Natural Community Conservation Plans

HCPs are planning documents required as part of an application for an ITP under ESA. They describe the activities that would be covered by the ITPs; the species for which incidental take would be authorized; measures that would, to the maximum extent practicable, minimize the adverse effects on the covered species resulting from implementation of the covered activities; and measures that mitigate any remaining adverse effects through the protection, restoration, creation, and/or enhancement of habitat for the covered species. They also describe the ways in which the HCP is to be funded.

The NCCPA provides a mechanism for compliance with state species regulatory requirements through the development of comprehensive, broad-based conservation plans—NCCPs—that focus on the needs of natural communities and the range of species that inhabit them (California Fish and Game Code Section 2800 et seq.) An NCCP identifies covered plants and wildlife and provides the conservation and management of natural biological diversity within the planning area, while allowing compatible and appropriate economic development, growth, and other human uses. Among other things, the plan must provide for the protection of habitat, natural communities, and species diversity on a landscape or ecosystem level through the creation and long-term management of habitat reserves or other conservation measures. Approved NCCPs provide the basis for issuance of state authorizations for the take of any covered species whose conservation and management is provided for in the plan approved by CDFW, including state-listed endangered and threatened species, nonlisted species, and fully protected species.

ES.4.2 Covered Species

ESA and the NCCPA set forth specific criteria that must be satisfied to support the issuance of regulatory authorizations that provide for the take of species. Incidental take authorization under state law is expected to occur under the NCCPA, which provides an alternative to take authorization under CESA. Pursuant to the 2009 Delta Reform Act, state incidental take authorization for the BDCP must be sought under the NCCPA rather than CESA if the BDCP is to be integrated into the Delta Plan, as adopted by the DSC, under the process set forth in the Delta Reform Act. The incidental take provisions of both ESA Section 10 and the NCCPA allow for applicants to include as *covered species* those species that are not currently listed as threatened or endangered, but that may become listed in the future, are likely to be present in the Plan Area or other areas within the geographic scope, and have a potential to be adversely affected by covered activities. Therefore, the BDCP includes as covered species not only species that are currently listed as threatened or endangered under federal and state law, but also fully protected species and species that are not currently listed but that may become listed in the future. BDCP covered species are listed in Table ES-2.

Table ES-2. BDCP Covered Species

| No. | Common Name | Scientific Name | Status (Fed/State/CRPR) ^a |
|--------------------------|---|------------------------------------|---|
| Fish (11 species) | | | |
| 1 | delta smelt [‡] | <i>Hypomesus transpacificus</i> | T/E/- |
| 2 | longfin smelt [‡] | <i>Spirinchus thaleichthys</i> | C/T/- |
| 3 | Chinook salmon, Sacramento River winter-run ESU* | <i>Oncorhynchus tshawytscha</i> | E/E/- |
| 4 | Chinook salmon, Central Valley spring-run ESU* | <i>Oncorhynchus tshawytscha</i> | T/T/- |
| 5 | Chinook salmon, Central Valley fall- and late fall-run ESU* | <i>Oncorhynchus tshawytscha</i> | -/SSC/- |
| 6 | Steelhead, Central Valley DPS* | <i>Oncorhynchus mykiss</i> | T/-/- |
| 7 | Sacramento splittail [‡] | <i>Pogonichthys macrolepidotus</i> | -/SSC/- |
| 8 | green sturgeon, southern DPS* | <i>Acipenser medirostris</i> | T/SSC/- |
| 9 | white sturgeon* | <i>Acipenser transmontanus</i> | -/-/- |
| 10 | Pacific lamprey [‡] | <i>Entosphenus tridentatus</i> | -/-/- |
| 11 | river lamprey [‡] | <i>Lampetra ayresii</i> | -/-/- |

| No. | Common Name | Scientific Name | Status (Fed/State/CRPR) ^a |
|----------------------------------|--|---|---|
| Mammals (5 species) | | | |
| 12 | riparian brush rabbit [‡] | <i>Sylvilagus bachmani riparius</i> | E/E/- |
| 13 | riparian woodrat (San Joaquin Valley) [‡] | <i>Neotoma fuscipes riparia</i> | E/SSC/- |
| 14 | salt marsh harvest mouse [‡] | <i>Reithrodontomys raviventris</i> | E/E, FP/- |
| 15 | San Joaquin kit fox [‡] | <i>Vulpes macrotis mutica</i> | E/T/- |
| 16 | Suisun shrew [‡] | <i>Sorex ornatus sinuosus</i> | -/SSC/- |
| Birds (1 species) | | | |
| 17 | California black rail [‡] | <i>Laterallus jamaicensis coturniculus</i> | -/T, FP/- |
| 18 | California clapper rail [‡] | <i>Rallus longirostris obsoletus</i> | E/E, FP/- |
| 20 | greater sandhill crane [‡] | <i>Grus canadensis tabida</i> | -/T,FP/- |
| 21 | least Bell's vireo [‡] | <i>Vireo bellii pusillus</i> | E/E/- |
| 22 | Suisun song sparrow [‡] | <i>Melospiza melodia maxillaries</i> | -/SSC/- |
| 23 | Swainson's hawk [‡] | <i>Buteo swainsoni</i> | -/T/- |
| 24 | tricolored blackbird [‡] | <i>Agelaius tricolor</i> | -/SSC/- |
| 25 | western burrowing owl [‡] | <i>Athene cunicularia hypugaea</i> | -/SSC/- |
| 26 | western yellow-billed cuckoo [‡] | <i>Coccyzus americanus occidentalis</i> | C/E/- |
| 27 | white-tailed kite [‡] | <i>Elanus leucurus</i> | -/FP/- |
| 28 | yellow-breasted chat [‡] | <i>Icteria virens</i> | -/SSC/- |
| Reptiles (2 species) | | | |
| 29 | giant garter snake [‡] | <i>Thamnophis gigas</i> | T/T/- |
| 30 | western pond turtle [‡] | <i>Actinemys marmorata</i> | -/SSC/- |
| Amphibians (2 species) | | | |
| 31 | California red-legged frog [‡] | <i>Rana draytonii</i> | T/SSC/- |
| 32 | California tiger salamander (Central Valley DPS) [‡] | <i>Ambystoma californiense</i> | T/T/- |
| Invertebrates (7 species) | | | |
| 33 | California linderiella [‡] | <i>Linderiella occidentalis</i> | -/-/- |
| 34 | conservancy fairy shrimp [‡] | <i>Branchinecta conservation</i> | E/-/- |
| 35 | longhorn fairy shrimp [‡] | <i>Branchinecta longiantenna</i> | E/-/- |
| 36 | midvalley fairy shrimp [‡] | <i>Branchinecta mesovallensis</i> | -/-/- |
| 37 | valley elderberry longhorn beetle [‡] | <i>Desmocerus californicus dimorphus</i> | T/-/- |
| 38 | vernal pool fairy shrimp [‡] | <i>Branchinecta lynchi</i> | T/-/- |
| 39 | vernal pool tadpole shrimp [‡] | <i>Lepidurus packardi</i> | E/-/- |
| Plants (18 species) | | | |
| 40 | alkali milk-vetch [‡] | <i>Astragalus tener</i> var. <i>Tener</i> | -/-/1B |
| 41 | Boggs Lake hedge-hyssop [‡] | <i>Gratiola heterosepala</i> | -/E/1B |
| 42 | Brittlescale [‡] | <i>Atriplex depressa</i> | -/-/1B |
| 43 | Carquinez goldenbush [‡] | <i>Isocoma arguta</i> | -/-/1B |
| 44 | Delta button celery [‡] | <i>Eryngium racemosum</i> | -/E/1B |
| 45 | Delta mudwort [‡] | <i>Limosella subulata</i> | -/-/2 |
| 46 | Delta tule pea [‡] | <i>Lathyrus jepsonii</i> var. <i>Jepsonii</i> | -/-/1B |
| 47 | dwarf downingia [‡] | <i>Downingia pusilla</i> | -/-/2 |
| 48 | Heartscale [‡] | <i>Atriplex cordulata</i> | -/-/1B |
| 49 | Heckard's peppergrass [‡] | <i>Lepidium latipes</i> var. <i>heckardii</i> | -/-/1B |

| No. | Common Name | Scientific Name | Status (Fed/State/CRPR) ^a |
|-----|--------------------------------------|--|---|
| 50 | Legenere [‡] | <i>Legenere limosa</i> | -/-/1B |
| 51 | Mason's lilaeopsis [‡] | <i>Lilaeopsis masonii</i> | -/R/1B |
| 52 | San Joaquin spearscale [‡] | <i>Atriplex joaquiniana</i> | -/-/1B |
| 53 | side-flowering skullcap [‡] | <i>Scutellaria lateriflora</i> | -/-/2 |
| 54 | slough thistle [‡] | <i>Cirsium crassicaule</i> | -/-/1B |
| 55 | soft bird's-beak [‡] | <i>Cordylanthus mollis</i> ssp. <i>Mollis</i> | E/R/1B |
| 56 | Suisun Marsh aster [‡] | <i>Symphotrichum lentum</i> | -/-/1B |
| 57 | Suisun thistle [‡] | <i>Cirsium hydrophilum</i> var. <i>hydrophilum</i> | E/-/1B |

ESU = Evolutionarily Significant Unit.

DPS = Distinct Population Segment.

[‡] Species under USFWS review authority.

* Species under NMFS review authority.

^a Status:

Federal

E = Listed as endangered under ESA.

T = Listed as threatened under ESA.

C = Candidate for listing under ESA.

State

E = Listed as endangered under CESA.

T = Listed as threatened under CESA.

R = Listed as rare under the California Native Plant Protection Act.

SSC = California species of special concern.

FP = Fully protected under the California Fish and Game Code.

California Rare Plant Rank (CRPR)

1B = rare or endangered in California and elsewhere.

2 = rare and endangered in California, more common elsewhere.

1

2 The provisions under ESA Section 10 and the NCCPA can provide for incidental take of covered
3 species within the 50-year life of the permit authorization. The BDCP and BDCP EIR/EIS are also
4 intended for use by Reclamation, USFWS, and NMFS as an element of regulatory compliance with
5 ESA Section 7. Section 7 provides federal agencies proposing actions that might adversely affect
6 endangered or threatened species with a process for obtaining a BiOp from USFWS and/or NMFS
7 regarding whether the action would jeopardize the continued existence of a listed species or
8 adversely modify or destroy critical habitat and may include incidental take authorization. The ESA
9 Section 10 process is not available to federal action agencies.

10 ES.4.3 Covered Activities

11 The BDCP includes *covered activities* and *associated federal actions*. Covered activities are those
12 actions that are carried out by nonfederal entities, such as DWR, and that are expected to be covered
13 by regulatory authorizations under ESA and NCCPA. The covered activities consist of activities in the
14 Plan Area associated with the conveyance and export of water supplies from the SWP's Delta
15 facilities and with implementation of the BDCP conservation strategy. Each of these activities falls
16 into one of six categories: (1) new water conveyance facilities construction, operation, and

1 maintenance; (2) operation and maintenance of SWP facilities; (3) nonproject diversions¹⁰;
 2 (4) habitat protection, restoration, creation, enhancement, and management; (5) monitoring
 3 activities; and (6) research.

4 Associated federal actions are those activities that are carried out, funded, or authorized by
 5 Reclamation within the Plan Area and that would receive appropriate ESA coverage through
 6 Section 7. These actions would be (1) operation of existing CVP Delta facilities to convey and export
 7 water in coordinated operation with the SWP after the BDCP is approved and implemented,
 8 (2) associated maintenance and monitoring activities, and (3) the creation of habitat. The federal
 9 actions by Reclamation would not be covered activities for the purposes of the ESA
 10 Section 10(a)(1)(B) permit. These federal actions are actions that occur within the Delta that would
 11 be coordinated with DWR to support DWR's compliance with the ESA Section 10 permit.
 12 Reclamation's activities are subject to ESA Section 7.

13 ES.4.4 Biological Goals and Objectives

14 The BDCP biological goals and objectives are the foundation of the conservation strategy and reflect
 15 the expected ecological outcomes of BDCP implementation. The biological goals and objectives also
 16 set out the broad principles used to help guide the development of the conservation strategy, and
 17 are intended to provide the following functions.

- 18 • Describe the desired biological outcomes of the conservation strategy and how those outcomes
 19 will contribute to the long-term conservation of covered species and their habitats.
- 20 • Provide, where feasible, quantitative targets and timeframes for achieving the desired outcomes.
- 21 • Serve as benchmarks by which to measure progress in achieving those outcomes across multiple
 22 temporal and spatial scales.
- 23 • Provide metrics for the monitoring program by which to evaluate the effectiveness of the
 24 conservation measures and, if necessary, provide a basis to adjust the conservation measures to
 25 achieve the desired outcomes.

26 The biological goals and objectives are organized hierarchically on the basis of the following
 27 ecological scale.

- 28 • **Landscape.** The landscape-scale biological goals and objectives focus on the extent, distribution,
 29 and connectivity among natural communities and improvements to the overall condition of
 30 hydrological, physical, chemical, and biological processes in the Plan Area in support of
 31 achieving natural community and species-specific biological goals and objectives.
- 32 • **Natural community.** Natural Community biological goals and objectives focus on maintaining
 33 or enhancing ecological functions and values of specific natural communities. Achieving natural
 34 community goals and objectives will also conserve the habitat of associated covered species and
 35 other native species.
- 36 • **Species.** Species biological goals and objectives address stressors and habitat needs specific to
 37 individual species (or, in some cases, groups of species with similar needs) that are not
 38 addressed under the landscape and natural community goals and objectives.

¹⁰ Nonproject diversions are those diversions not included as part of SWP and CVP operations.

The biological goals and objectives describe the desired future conditions of the Plan Area and set the benchmarks for evaluating BDCP performance relative to ecological health. They reflect the relationship between projected environmental changes and anticipated species responses and are intended to be attainable through the implementation of the conservation measures (described in Section ES.4.5, *Conservation Measures*).

ES.4.5 Conservation Measures

The 22 BDCP conservation measures comprise the specific actions to be taken to meet the biological goals and objectives. Most of the conservation measures address several goals and objectives, and most objectives will be met through a combination of conservation measures. Actions implemented as part of the conservation measures will meet the requirements of the ESA and the NCCPA. The conservation measures are designed to contribute to the recovery of the covered species, and include protecting, restoring, creating, and/or enhancing aquatic and terrestrial species habitat, natural communities, and landscape, as well as reducing the adverse effects of water diversions on certain covered species while providing a reliable water supply. The conservation measures fit into the same ecological hierarchy as the biological goals and objectives, as described below.

- **Landscape.** Landscape-scale conservation measures are designed to improve the overall condition of hydrological, physical, chemical, and biological processes in the Plan Area. These measures include improving the method, timing, and amount of flow and quality of water into and through the Delta for the benefit of covered species and natural communities. They also focus on establishing a reserve system, an interconnected system of protected lands across the Plan Area.
- **Natural community.** Natural community conservation measures include actions to restore natural communities to expand the extent and quality of intertidal, floodplain, and other ecological functions and processes.
- **Species.** Species-specific conservation measures are designed to reduce the adverse effects of various stressors on one or more covered species. These include measures addressing toxic contaminants, nonnative predators, illegal harvest, and genetic threats.

The covered activities are included in the proposed conservation measures (Table ES-3). CM1–CM3 are intended to manage the routing, timing, and flow through the Delta while establishing an interconnected system of conserved lands across the Plan Area. CM4–CM11 were developed to restore, create, enhance, and manage physical habitat to expand the extent and quality of intertidal, floodplain, and other habitats across defined Conservation Zones (CZs) and Restoration Opportunity Areas (ROAs)¹¹ (Figure ES-2). The remaining conservation measures, CM12–CM21, are intended to reduce the adverse effects of various stressors, including but not limited to environmental contaminants, nonnative predators, and illegal harvest, on covered species. CM22 is a suite of activities intended to avoid or minimize direct take of covered species and minimize impacts on natural communities that provide habitat for covered species.

¹¹ The Plan Area is subdivided into 11 Conservation Zones within which conservation targets for natural communities and covered species' habitats have been established. The five Restoration Opportunity Areas encompass those locations in the Plan Area considered most appropriate for the restoration of tidal habitats and within which restoration goals for tidal and associated upland natural communities will be achieved.

1 **Table ES-3. Proposed BDCP Conservation Measures**

| CM | Title | General Description |
|-----------|---|--|
| 1 | Water Facilities and Operation | This CM provides for the construction and operation of a new north Delta water conveyance facility to bring water from the Sacramento River in the north Delta to the existing water export pumping plants in the south Delta, as well as for the operation of existing south Delta export facilities. The 15 action alternatives for the proposed BDCP differ in the location, design, and operation of conveyance facilities/improvements implemented under CM1. The total capacity of the proposed north Delta water conveyance facility would be 3,000–15,000 cubic feet/second, depending on the alternative. |
| 2 | Yolo Bypass Fisheries Enhancement | The Fremont Weir and Yolo Bypass would be modified to increase the frequency, duration, and magnitude of floodplain inundation and to improve fish passage in the Yolo Bypass. |
| 3 | Natural Communities Protection and Restoration | A system of conservation lands in the Plan Area would be established by acquiring lands for protection and restoration. |
| 4 | Tidal Natural Communities Restoration | 65,000 acres of tidal natural communities restoration would occur, including a minimum of 24,000 acres of intertidal freshwater wetland and 6,000 acres of brackish wetland. Under Alternative 5, tidal habitat restoration would be limited to 25,000 acres. |
| 5 | Seasonally Inundated Floodplain Restoration | 10,000 acres of seasonally inundated floodplains that historically existed in the Plan Area, but have been lost as a result of flood control and channelization, would be restored. Under Alternative 7, 20,000 acres of seasonally inundated floodplain would be restored. |
| 6 | Channel Margin Enhancement | 20 linear miles of channel margin would be enhanced by improving channel geometry and restoring riparian, marsh, and mudflat habitats on the waterside side of levees along channels that provide rearing and outmigration habitat for juvenile salmonids. Under Alternative 7, 40 linear miles of channel margin habitat would be enhanced. |
| 7 | Riparian Natural Community Restoration | 5,000 acres of native riparian forest and scrub would be restored, and 750 acres would be protected. This restoration would be in association with restoration of tidal and floodplain areas (CM4 and CM5, respectively) and channel margin enhancements (CM6). |
| 8 | Grassland Natural Community Restoration | 2,000 acres of grassland habitat would be restored, and 8,000 acres would be protected. |
| 9 | Vernal Pool and Alkali Seasonal Wetland Complex Restoration | Up to 67 acres of vernal pool complex and 72 acres of alkali seasonal wetland complex would be restored to achieve no net loss in acreage from BDCP covered activities. In addition, at least 600 acres of vernal pool complex would be protected in conjunction with 150 acres of alkali seasonal wetland complex. |
| 10 | Nontidal Marsh Restoration | 1,200 acres of nontidal marsh would be restored. |
| 11 | Natural Communities Enhancement and Management | Natural communities and covered species' habitats would be enhanced and managed. |
| 12 | Methylmercury Management | The conditions that promote production of methylmercury in restored areas and its subsequent introduction to the foodweb, and to covered species in particular, would be minimized. |
| 13 | Invasive Aquatic Vegetation Control | The introduction and spread of invasive aquatic vegetation in aquatic restoration areas would be prevented and controlled. |

| CM | Title | General Description |
|----|--|---|
| 14 | Stockton Deep Water Ship Channel Dissolved Oxygen Levels | The Stockton Deep Water Ship Channel DWR Aeration Facility would be operated to maintain dissolved oxygen concentrations above target levels during the BDCP permit term. |
| 15 | Localized Reduction of Predatory Fishes (Predator Control) | Populations of nonnative predatory fishes would be reduced at specific locations, and holding habitat for these predatory fishes would be eliminated or modified at selected locations of high predation risk. |
| 16 | Nonphysical Fish Barriers | Nonphysical barriers (structures combining sound, light, and bubbles) would be installed at the head of Old River, Delta Cross Channel, Georgiana Slough, and possibly Turner Cut and Columbia Cut to deter juvenile salmonids from using specific channels/migration routes that may contribute to decreased survival. |
| 17 | Illegal Harvest Reduction | Funding would be provided to CDFW to increase the enforcement of fishing regulations to reduce illegal harvest of Chinook salmon, Central Valley steelhead, green sturgeon, and white sturgeon in the Delta, bays, and upstream waterways. |
| 18 | Conservation Hatcheries | New delta smelt and longfin smelt conservation propagation programs would be established and existing programs would be expanded to ensure the existence of refugial captive populations of these species to help reduce their risks of extinction. |
| 19 | Urban Stormwater Treatment | Funding would be provided for implementing stormwater treatment measures in urban areas that would result in decreased discharge of contaminants to the Delta. |
| 20 | Recreational Users Invasive Species Program | A Delta Recreational Users Invasive Species Program would be funded. This program would implement actions to prevent the introduction of new aquatic species and reduce the spread of existing aquatic invasive species by means of recreational watercraft, trailers, and other mobile recreational equipment used in aquatic environments in the Plan Area. |
| 21 | Nonproject Diversions | Funding would be provided for actions that would minimize the potential for entrainment of covered fish species associated with operation of nonproject diversions (diversions other than those related to the SWP and CVP). |
| 22 | Avoidance and Minimization Measures | Avoidance and minimization measures would be implemented to avoid and minimize effects on covered species and natural communities that could result from BDCP covered activities. These measures would be implemented for all BDCP covered activities through the BDCP permit term. |

1

2 ES.4.6 Implementation Schedule

3 The conservation strategy is divided into near-term (NT) and long-term (LT) implementation stages.
4 The NT implementation would last until the north Delta diversions and the new water conveyance
5 facilities are constructed and operational. LT implementation would last 40 years—that is, through
6 the remainder of the proposed 50-year BDCP permit term. The LT implementation stage is further
7 divided into two sub-phases: Early long-term (Year 11 through Year 15) and Late long-term (Year
8 16 through Year 50). This division of the implementation period was used because dual conveyance
9 from north and south Delta intakes would bring significant flexibility and ecological changes to the
10 system. As a result, many of the conservation measures are interrelated with operations of the new
11 conveyance. NT implementation of conservation measures would be intended to provide a response
12 to currently degraded or absent ecological functions, while building the foundation to improve long-
13 term ecological functions. The NT measures include early habitat creation or restoration actions,

implementation of conservation measures that address other stressors on covered fish species, and acquisition of terrestrial and wetland habitat to facilitate conservation of covered wildlife and plant species.

ES.5 Alternatives Considered in the EIR/EIS

CEQA and NEPA require that an EIR and EIS include a detailed analysis of a reasonable range of alternatives to a proposed project. CEQA requires that an EIR evaluate alternatives to the proposed project that are potentially feasible and would achieve most of the basic project objectives while avoiding or substantially reducing project impacts. NEPA requires that a reasonable range of alternatives that meet the purpose and need of the proposed federal action be analyzed in an EIS at an equivalent level of detail to that of the proposed action. Under NEPA, a range of reasonable alternatives is analyzed to define the issues and provide a clear basis for choice among the options. The joint CEQA/NEPA analysis must also include an analysis of a no project alternative (for CEQA) and a no action alternative (for NEPA).

The BDCP EIR/EIS evaluates 15 action alternatives and a no action alternative (also the CEQA no project alternative; see Section ES.5.1.2, *No Action Alternative*). Alternative 4 is the Proposed Project (the proposed BDCP) and DWR's "Preferred Alternative" for purposes of CEQA. It is consistent with the proposed BDCP published concurrently with publication of the Draft EIR/EIS. Over the course of preparing the environmental analyses, Alternative 4 was refined and improved to identify a form of the proposed BDCP (Proposed Project) that is grounded in solid science and reaches what DWR considers to be an optimal balance between ecological and water supply objectives. Notably, identification of Alternative 4 as the preferred CEQA alternative is tentative, and is subject to change as DWR and its partner lead and responsible agencies receive and consider public and agency input on the EIR/EIS. It is therefore possible that the final version of the BDCP may differ from Alternative 4 as described herein, either because Alternative 4 itself was further refined, because another alternative was determined to be preferable, or because the Lead Agencies, in response to input, developed a new alternative with some features from some existing alternatives and other features from other existing alternatives¹².

The following sections briefly describe the screening/development process and criteria used to develop the range of alternatives considered in the EIR/EIS and the components of those alternatives.

¹² Just as further public and agency input may result in a new preferred CEQA alternative or a modification of Alternative 4 in its current form, the same is true of the text of the proposed BDCP published contemporaneously with this Draft EIR/EIS. In particular, Chapter 9, *Alternatives to Take*, of the BDCP, may be revised in light of further input regarding the practicability of the alternatives tentatively rejected therein. In other words, the current analysis in BDCP Chapter 9 of the impracticability of various alternatives to take, though representing DWR's best thinking as of the date of its release, remains subject to change. It should be noted that the alternatives set out in Chapter 9 of the BDCP are not identical to the EIR/EIS alternatives; nor are they subject to the same analysis. In Chapter 9 of the BDCP, the analysis of the alternatives is focused solely on the potential for each of these alternatives to reduce the take of federally listed species in relationship to the proposed action. The alternatives addressed in the EIR/EIS, in contrast, are subject to a far broader analysis.

ES.5.1 EIR/EIS BDCP Development of Alternatives

A primary goal of the BDCP is to achieve long-term compliance with ESA and the NCCPA with respect to the operation of existing SWP facilities in the Delta, and the construction and operation of new conveyance facilities for the movement of water entering the Delta from the Sacramento Valley watershed to the existing SWP and CVP pumping plants in the south Delta. Therefore, the primary component of the BDCP related to the focus in development of alternatives was CM1—the water conveyance facilities combined with the operational scenarios under which they would be managed.

ES.5.1.1 Alternatives Development Screening Process

The process for developing the BDCP alternatives was initiated in 2006 with organization of the BDCP Steering Committee. The Steering Committee was composed of representatives from a number of agencies and stakeholder organizations that have interest in or are involved in management of resources in the Delta. All meetings of the Steering Committee were open to the public, and all presentations and documents discussed at the meetings were made available on the BDCP website. The Steering Committee convened various working groups and technical teams to develop technical information or recommendations about aspects of alternative conservation plan concepts. The Steering Committee, working groups, and technical teams met from 2006 through 2010.

In 2006–2007, the Steering Committee conducted a preliminary analysis of broadly defined conveyance alignment concepts to evaluate and consider the benefits and constraints of different water conveyance alignment approaches. During this stage, the committee refined the range of the conveyance alignment concepts to four Conservation Strategy Options. In September 2007 the committee completed the *Conservation Strategy Options Evaluation Report* (BDCP Steering Committee 2007) presenting the four options that generally encompassed two through-Delta conveyance variations, a dual conveyance option utilizing isolated conveyance and through-Delta conveyance, and an isolated conveyance option. As the name suggests, the *through-Delta* options would involve conveyance of water from the Sacramento River through the Delta using existing channels for diversion by the SWP/CVP south Delta facilities. A *dual conveyance* option would involve development of new north Delta diversion facilities to be operated in conjunction with existing SWP/CVP export facilities in the south Delta. An *isolated conveyance* option would consist only of new north Delta diversion facilities, and the existing facilities in the south Delta would no longer be operated.

By early 2008, DWR and the federal Lead Agencies had initiated the public scoping process for the EIR/EIS; additional scoping processes were also conducted in early 2009. Additionally during this time, the Steering Committee continued to meet and there was ongoing correspondence with the California Natural Resources Agency regarding water conveyance alignment approaches. As a result of these combined processes, 15 water conveyance concepts, focused on the possible alternative alignments for the water conveyance facilities (CM1), were developed. These concepts retained variations of the initial concepts of through-Delta, dual conveyance, and isolated conveyance approaches.

These 15 water conveyance concepts were then evaluated in a multi-level screening process referred to as the initial or first screening. The first screening utilized three levels of screening criteria—designed to ensure that the legal requirements under both CEQA and NEPA were met

(Table ES-4). Eight of the 15 initial water conveyance concepts were eliminated through this first screening process.

Table ES-4. Screening Criteria for Water Conveyance Alternative Alignment Concepts

| Screening Level | Focus Criteria |
|-----------------|--|
| First | Allow for the conservation and management of covered species; protect, restore, and enhance certain aquatic, riparian, and associated terrestrial natural communities/ecosystems; reduce adverse effects on certain listed species through use of existing SWP and CVP diversion facilities and new SWP intakes; and restore and protect SWP and CVP water reliability. |
| Second | Avoid or substantially lessen expected significant environmental effects of the proposed project, and address significant issues related to the proposed action. |
| Third | Define potentially feasible alternatives under CEQA and reasonable alternatives under NEPA; consider the technical and economic feasibility/practicality of alternatives; consider whether an alternative would violate federal or state statutes or regulations; and if an alternative would balance relevant economic, environmental, social, and technological factors. |

In addition to the conveyance facility alignment alternatives, the Steering Committee working groups and technical teams developed screening evaluations to consider operations and habitat restoration activities. By 2011, the state and federal agencies and environmental organizations had identified a range of north Delta intake capacities and conveyance operation alternatives.

The water conveyance alignment concepts developed through the first screening process were combined with the operational concepts identified in 2011 and a second screening process was implemented. This process generated 21 possible alternatives, which were then evaluated using the same First, Second, and Third Level Screening Criteria (Table ES-4). In addition, these alternatives were evaluated against the requirements of the Delta Reform Act and for consistency with scoping comments from responsible and cooperating agencies related to the range of alternatives, and relative to legal rights and entitlements of entities that are not BDCP participants and whose legal rights and entitlements are beyond the authority and reach of CDFW, USFWS, and NMFS. By using these criteria to narrow the range to a more manageable field, the alternatives were reduced by summer 2011 to a proposed project (the proposed BDCP), 14 action alternatives, and a no action/no project alternative.

On July 25, 2012, California Governor Edmund G. Brown Jr., Secretary of the Interior Ken Salazar, and National Oceanic and Atmospheric Administration (NOAA) Assistant Administrator for Fisheries Eric Schwaab outlined revisions to the proposed BDCP. As revised, the proposal includes the following: (1) the construction of water intake facilities with a total capacity of 9,000 cubic feet per second (cfs), down from an earlier proposal of 15,000 cfs; (2) operations that would be phased in over several years; and (3) a conveyance system designed to use gravity flow to maximize energy efficiency and to minimize environmental impacts. This proposal as revised is analyzed in the BDCP Effects Analysis. It involves Intakes 2, 3, and 5; two tunnels to convey water by gravity; no intermediate pumping plant; and operations guided by Scenario H (described in Section ES.5.2.2).

The EIR/EIS analyzes the proposed BDCP as Alternative 4¹³. The proposed project, as embodied in the draft BDCP document published together with the EIR/EIS, will form a major portion of the HCP and NCCP that support applications for take authorization and other permits needed to proceed with implementation of the BDCP.

The action alternatives generally consist of new diversion/intake structures, water conveyance facilities and associated operational criteria, conservation components to provide habitat restoration, and additional conservation components to reduce other stressors that affect covered species and their habitats in the Plan Area. The alternatives selected for analysis in the EIR/EIS are listed below.

- No Action Alternative
- Alternative 1A—Dual Conveyance with Pipeline/Tunnel and Intakes 1–5 (15,000 cfs; Operational Scenario A)
- Alternative 1B—Dual Conveyance with East Alignment and Intakes 1–5 (15,000 cfs; Operational Scenario A)
- Alternative 1C—Dual Conveyance with West Alignment and Intakes W1–W5 (15,000 cfs; Operational Scenario A)
- Alternative 2A—Dual Conveyance with Pipeline/Tunnel and Five Intakes (15,000 cfs; Operational Scenario B)
- Alternative 2B—Dual Conveyance with East Alignment and Five Intakes (15,000 cfs; Operational Scenario B)
- Alternative 2C—Dual Conveyance with West Alignment and Intakes W1–W5 (15,000 cfs; Operational Scenario B)
- Alternative 3—Dual Conveyance with Pipeline/Tunnel and Intakes 1 and 2 (6,000 cfs; Operational Scenario A)
- Alternative 4—Dual Conveyance with Modified Pipeline/Tunnel and Intakes 2, 3, and 5 (9,000 cfs; Operational Scenario H): Proposed Project / CEQA “Preferred Alternative”
- Alternative 5—Dual Conveyance with Pipeline/Tunnel and Intake 1 (3,000 cfs; Operational Scenario C)
- Alternative 6A—Isolated Conveyance with Pipeline/Tunnel and Intakes 1–5 (15,000 cfs; Operational Scenario D)
- Alternative 6B—Isolated Conveyance with East Alignment and Intakes 1–5 (15,000 cfs; Operational Scenario D)
- Alternative 6C—Isolated Conveyance with West Alignment and Intakes W1–W5 (15,000 cfs; Operational Scenario D)
- Alternative 7—Dual Conveyance with Pipeline/Tunnel, Intakes 2, 3, and 5, and Enhanced Aquatic Conservation (9,000 cfs; Operational Scenario E)

¹³ In February 2012, Alternative 4 included Intakes 1, 2, and 3 and an intermediate pumping plant, along with a set of operational criteria including provisions for Fall X2. This alternative has been updated to reflect the elements introduced in the July 2012 announcement.

- Alternative 8—Dual Conveyance with Pipeline/Tunnel, Intakes 2, 3, and 5, and Increased Delta Outflow (9,000 cfs; Operational Scenario F)

- Alternative 9—Through-Delta/Separate Corridors (15,000 cfs; Operational Scenario G)

These alternatives are briefly described in the following sections.

ES.5.1.2 No Action Alternative

CEQ regulations for implementing NEPA require an EIS to include evaluation of a No Action Alternative (40 CFR 1502.14). At the lead agencies' discretion under NEPA, the No Action Alternative may be described as the future circumstances without the proposed action and can also include predictable actions by persons or entities, other than the federal agencies involved in a project action, acting in accordance with current management direction or level of management intensity. When the proposed action involves updating an adopted management plan or program, the No Action Alternative includes the continuation of the existing management plan or program. The CEQ suggests that the No Action Alternative may provide a benchmark that allows decision makers to compare the magnitude of environmental effects of the action alternatives (46 Federal Register [FR] 18026, March 23, 1981).

Under CEQA, an EIR is required to analyze the No Project Alternative. The No Project Alternative allows decision makers to use the EIR to compare the impacts of approving the proposed project with the future conditions of not approving the proposed project. Under CEQA, the No Project Alternative is not the baseline for assessing the significance of impacts of the Proposed Project. State CEQA Guidelines Section 15126.6, Subdivision (e)(2) indicates that No-Project conditions may include some reasonably foreseeable changes in Existing Conditions and changes that would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.

Under the No Action Alternative, also characterized as meaning *no federal action*, the federal ITPs related to the proposed BDCP would not be issued and permit applicants would remain subject to the take prohibition for listed species and other ESA requirements. Ongoing activities or future actions that may result in the incidental take of federally listed species would need to be permitted through ESA Section 7 or Section 10. Reclamation would continue to operate the CVP consistent with current management direction. For the EIR/EIS analysis, the No Action Alternative assumptions are limited to Existing Conditions, programs adopted during the early stages of development of the EIR/EIS, facilities that are permitted or under construction during the early stages of development of the EIR/EIS, projects that are permitted or are assumed to be constructed by 2060, and changes due to climate change that would occur with or without the proposed action or alternatives. These assumptions represent continuation of the existing plans, policies, and operations and conditions that represent continuation of trends in nature.

Because the BDCP No Action Alternative assumptions are consistent with the requirements and limitations prescribed by CEQA, the No Action Alternative also represents the No Project Alternative. For ease of reference, the joint No Action/No Project Alternative is referred to as the No Action Alternative. The No Action Alternative assumptions include the basic description of the No Action Alternative, assumptions related to the SWP and CVP, ongoing programs and policies by governmental and nongovernmental entities, projections related to climate change, and assumptions related to annual actions that vary every year. Among the ongoing programs by

governmental entities that are included in the No Action Alternative are many of the actions required by the 2008 and 2009 USFWS and NMFS BiOps.

ES.5.1.3 BDCP Action Alternatives

The action alternatives evaluated in the EIR/EIS comprise combinations of the following: conservation measures identified in the BDCP conservation strategy that include a proposal for water conveyance facilities, the operation of which is intended to manage the routing, timing, and amount of flow through the Delta while establishing an interconnected system of conservation lands across the Plan Area (CM1–CM3); measures to protect, restore, enhance, and manage physical habitat by expanding the extent and quality of intertidal, floodplain, and other habitats across defined CZs and ROAs (CM2–CM11); and measures to reduce the effect of various ecological stressors on covered species, such as toxic contaminants, nonnative predators, illegal harvest, and nonproject water diversions, many of which are unrelated to operation and conveyance of water through SWP/CVP Delta facilities (CM12–CM21). CM22 includes activities intended to avoid or minimize direct take of covered species and minimize impacts on natural communities that provide habitat for covered species. CM1–CM22 are common to all the BDCP alternatives, with varying designs, locations, and operational scenarios for water conveyance facilities proposed under CM1 and varying amounts of habitat restoration, protection, and enhancement for CM2–CM11. Table ES-5 presents an overview of the action alternatives.

The action alternatives for the EIR/EIS were developed through the screening process described in Section ES.5.1.1, *Alternatives Development Screening Process*, and were developed to meet all or most of the objectives and purpose and need of the BDCP described in Section ES.2, *Project Objectives/Purpose and Need*. The 15 action alternatives are variations of conservation plans that differ primarily in the location of intake structures and conveyance alignment, design, diversion capacities (ranging from 3,000 to 15,000 cfs), and operational scenarios of water conveyance facilities that would be implemented under CM1. Depending on the alternative, the water conveyance facility components would create a new conveyance mechanism or use existing water corridors to divert water from the north Delta to existing SWP and CVP export facilities in the south Delta, utilizing operational guidelines to achieve the BDCP planning goals.

In general, the numbering of alternatives in the EIR/EIS reflects the fact that three sets of three alternatives share many common elements and only one or a handful of differences. Thus, Alternatives 1A, 1B, and 1C would all involve *dual conveyance* scenarios with a total of 15,000 cfs of capacity operated under Operational Scenario A, developed in early 2010. They differ only in that Alternative 1A would use a pipeline/tunnel, rather than a surface canal, as its major conveyance facility. Alternative 1B would entail an eastside canal, while Alternative 1C would entail a combination of a westside canal and pipeline/tunnel. Similarly, Alternatives 2A, 2B, and 2C would use the same three dual conveyance designs as 1A, 1B, and 1C with a total capacity of 15,000 cfs, but they would be operated under Operational Scenario B rather than Scenario A. Scenario B was developed in early 2011 and reflects a greater degree of input from USFWS, NMFS, and CDFW than does Scenario A. Alternatives 6A, 6B, and 6C represent a similar approach—that is, they use the same respective physical alignments as 1A, 1B, and 1C—but they would constitute an *isolated conveyance* facility with 15,000 cfs of capacity operated under Scenario D, which is a modification of Scenario A, eliminating the use of south Delta intakes. Most action alternatives share the same set of conservation components, with variations incorporated into Alternatives 5, 7, and 9. All action alternatives share the same measures to reduce other stressors.

The *dual conveyance* water delivery system would consist of new north Delta diversion facilities and the existing SWP/CVP export facilities in the south Delta. The north Delta diversion would be the primary diversion point using specific operating criteria and would be operated in conjunction with the existing south Delta diversion. The existing south Delta diversion would only operate when the north Delta diversion is nonoperational during infrequent maintenance or repair periods. The five intakes that would be constructed and operated under Alternatives 2A, 2B, and 2C would involve either Intakes 1–5 or Intakes 1, 2, 3, 6, and 7.

The *isolated conveyance* water delivery system would consist only of new north Delta diversion facilities. The SWP/CVP south Delta diversion points would no longer be operated. For the SWP this means the gated intake on Old River, Clifton Court Forebay, and the Skinner Fish Facility would no longer be operated. For the CVP this means the diversion point on Old River and the Tracy Fish Collection Facility would no longer be operated.

The *through delta / separate corridors* (Alternative 9) water delivery system would convey water from the Sacramento River through the Delta using existing Delta channels for diversion by the SWP and CVP pumping plants.

ES.5.2 Components of the BDCP Action Alternatives

ES.5.2.1 Physical Components

The possible water diversion and conveyance facilities that could be included in one or more of the BDCP action alternatives are listed below. Not all components listed would be found in each alternative (see Table ES-6).

- **Intakes**—any single action alternative would include the construction of between one and five intakes. With the exception of Alternative 9, these would be new on-bank facilities constructed on the Sacramento River between Clarksburg and Walnut Grove. For Alternatives 1C, 2C, and 6C, the intakes would be on the west bank of the river instead of the east bank. Under Alternative 9, intakes would be placed at the Delta Cross Channel and Georgiana Slough. All intakes would be equipped with fish screens designed to be protective of salmonids and delta smelt and comply with CDFW and NMFS fish screening criteria.
- **Pumping plants**—would include sedimentation basins, solids handling facilities, transition structures, surge towers, substation(s), transformers, a mechanical room, an access road, and other associated facilities and utilities. Some or all of these facilities would be associated with pumping plants under each action alternative.
- **Pipelines**—intake pipelines would carry water between intakes and intake pumping plants and conveyance pipelines would carry water between intake pumping plants and other conveyance facilities such as the tunnels, canals, and forebays. In addition, a combination of pipelines/tunnels would be part of the primary conveyance facilities for Alternatives 1A, 1C, 2A, 2C, 3, 4, 5, 6A, 6C, 7, and 8 (Table ES-6).
- **Tunnels**—tunnel segments of various length and capacity would be involved to convey water in each of the alternatives, except for Alternative 9. In addition, a combination of pipelines/tunnels would be part of the primary conveyance facilities for Alternatives 1A, 1C, 2A, 2C, 3, 4, 5, 6A, 6C, 7, and 8 (Table ES-6).

1 **Table ES-5. Action Alternatives Evaluated in the BDCP EIR/EIS**

| EIR/EIS Alternative Number | Conveyance | Conveyance Alignment | Intakes Selected for Analysis | North Delta Diversion Capacity (cfs) | Operations ^e | Conservation Components | Measures to Reduce Other Stressors | Associated NMFS and USFWS Action |
|----------------------------------|-------------------|-------------------------|---|--|-------------------------|--|---|---|
| 1A | Dual ^a | Pipeline/ Tunnel | 1, 2, 3, 4, 5 | 15,000 | Scenario A | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | Issuance of 50-year Incidental Take Permits for BDCP Covered Species |
| 1B | Dual ^a | East | 1, 2, 3, 4, 5 | 15,000 | Scenario A | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | Issuance of 50-year Incidental Take Permits for BDCP Covered Species |
| 1C | Dual ^a | West | West side intakes 1, 2, 3, 4, 5 ^g | 15,000 | Scenario A | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | Issuance of 50-year Incidental Take Permits for BDCP Covered Species |
| 2A | Dual ^a | Pipeline/ Tunnel | 1, 2, 3, 4, 5 (or 1, 2, 3, 6, 7) ^b | 15,000 | Scenario B | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | Issuance of 50-year Incidental Take Permits for BDCP Covered Species |
| 2B | Dual ^a | East | 1, 2, 3, 4, 5 (or 1, 2, 3, 6, 7) ^b | 15,000 | Scenario B | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | Issuance of 50-year Incidental Take Permits for BDCP Covered Species |
| 2C | Dual ^u | West | West side intakes 1, 2, 3, 4, 5 ^g | 15,000 | Scenario B | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | Issuance of 50-year Incidental Take Permits for BDCP Covered Species |
| 3 | Dual ^a | Pipeline/ Tunnel | 1, 2 ⁱ | 6,000 | Scenario A | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | Issuance of 50-year Incidental Take Permits for BDCP Covered Species |

| EIR/EIS Alternative Number | Conveyance | Conveyance Alignment | Intakes Selected for Analysis | North Delta Diversion Capacity (cfs) | Operations ^e | Conservation Components | Measures to Reduce Other Stressors | Associated NMFS and USFWS Action |
|-----------------------------------|-----------------------|--------------------------|--|--------------------------------------|-------------------------|--|--|--|
| 4 (CEQA Preferred Alternative) | Dual ^a | Modified Pipeline/Tunnel | 2, 3, 5 | 9,000 | Scenario H | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | Issuance of 50-year Incidental Take Permits for BDCP Covered Species |
| 5 | Dual ^a | Pipeline/Tunnel | 1 | 3,000 | Scenario C | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f); tidal habitat restoration limited to 25,000 acres | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | Issuance of 50-year Incidental Take Permits for BDCP Covered Species |
| 6A | Isolated ^c | Pipeline/Tunnel | 1, 2, 3, 4, 5 | 15,000 | Scenario D | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | Issuance of 50-year Incidental Take Permits for BDCP Covered Species |
| 6B | Isolated ^c | East | 1, 2, 3, 4, 5 | 15,000 | Scenario D | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | Issuance of 50-year Incidental Take Permits for BDCP Covered Species |
| 6C | Isolated ^c | West | West side intakes 1, 2, 3, 4, 5 ^g | 15,000 | Scenario D | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | Issuance of 50-year Incidental Take Permits for BDCP Covered Species |
| 7 | Dual ^a | Pipeline/Tunnel | 2, 3, 5 ⁱ | 9,000 | Scenario E | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f); additional 20 linear miles of channel margin habitat enhancement and 10,000 acres of seasonally inundated floodplain | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | Issuance of 50-year Incidental Take Permits for BDCP Covered Species |

| EIR/EIS Alternative Number | Conveyance | Conveyance Alignment | Intakes Selected for Analysis | North Delta Diversion Capacity (cfs) | Operations ^e | Conservation Components | Measures to Reduce Other Stressors | Associated NMFS and USFWS Action |
|----------------------------|----------------------------|---|--|--------------------------------------|-------------------------|---|--|--|
| 8 | Dual ^a | Pipeline/Tunnel | 2, 3, 5 ⁱ | 9,000 | Scenario F | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | Issuance of 50-year Incidental Take Permits for BDCP Covered Species |
| 9 | Through-Delta ^d | Through-Delta/Separate Corridors ^d | Screened intakes at Delta Cross Channel and Georgiana Slough | 15,000 ^d | Scenario G | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f); changes in the south Delta ^h | per BDCP Steering Committee Proposed Project (3/25/10 BDCP Steering Committee Handout ^f) | Issuance of 50-year Incidental Take Permits for BDCP Covered Species |

^a The *Dual Conveyance* water delivery system would consist of the new north Delta diversion facilities and the existing SWP/CVP export facilities in the south Delta. The north Delta diversion would be the primary diversion point using specific operating criteria and would be operated in conjunction with the existing south Delta diversion. The existing south Delta diversion would only operate on its own when the north Delta diversion is nonoperational during infrequent periods for maintenance or repair.

^b Under Alternatives 2A, 2B, and 2C a total of five intakes would be constructed and operated. Intake locations 1–5 or 1, 2, 3, 6, and 7 are analyzed for these alternatives.

^c The *Isolated Conveyance* water delivery system would consist only of the new north Delta diversion facilities. The SWP/CVP south Delta diversion points would no longer be operated. For the SWP this means the gated intake on Old River, Clifton Court Forebay, and the Skinner Fish Facility would no longer be operated. For the CVP this means the diversion point on Old River and the Tracy Fish Collection Facility would no longer be operated.

^d The *Through-Delta/Separate Corridors* water delivery system would convey water from the Sacramento River through the Delta using existing Delta channels for diversion by the SWP and CVP pumping plants. While the north Delta diversion capacity associated with this alternative is up to 15,000 cfs, it differs from the other action alternatives in that this capacity would be provided by flows through existing channels.

^e See Table 3-6 for a summary of the individual rules that comprise the operational scenarios and a comparison by scenario and alternative. An overview of operational scenarios is provided in Section 3.4.1.2 while a more detailed description appears in Section 3.6.4.2.

^f The BDCP Steering Committee Handout of 3/25/10 is available at:

<<http://baydeltaconservationplan.com/BDCPPlanningProcess/BackgroundDocuments/SteeringCommittee/SteeringCommitteeAgendasAndHandouts.aspx>>.

^g The west side intakes would be located on the west bank of the Sacramento River.

^h Under this alternative, lands acquired for restoration or enhancement in the south Delta would not be located alongside corridors designated for water supply.

ⁱ The intake locations listed represent those locations selected for the analysis of each BDCP alternative. Based on the results of an October 2011 workshop on the Phased Construction of North Delta Intake Facilities (see Appendix 3F, *Intake Location Analysis*), different combinations of intakes could be constructed under these alternatives. Once an alternative is selected as part of the final BDCP, a decision regarding intake locations will be made.

- **Canals**—would be unlined (earthen) or lined with concrete. Canal lengths and capacities would vary among alternatives. Canals would be a primary component of the water conveyance structure for Alternatives 1B, 1C, 2B, 2C, 6B, and 6A (Table ES-6).

Table ES-6. Water Conveyance Facilities Components of Each Alternative

| Component | Alternative | | | | | | | | | | | | | | | | |
|---|-------------|----|----|----|----|----|----|---|---|---|----|----|----|---|---|----------------|--|
| | No Action | 1A | 1B | 1C | 2A | 2B | 2C | 3 | 4 | 5 | 6A | 6B | 6C | 7 | 8 | 9 ^c | |
| New north Delta fish-screened intakes | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| New intake pumping plants | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | |
| New diversion pumping plants | | | | | | | | | | | | | | | | X | |
| New intermediate pumping plant | | X | X | X | X | X | X | X | | X | X | X | X | X | X | | |
| Use of existing SWP and CVP south Delta intake facilities | X | X | X | X | X | X | X | X | X | X | | | | X | X | X | |
| Operations of North Bay Aqueduct Alternative Intake Project | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| Byron Tract Forebay ^a | | X | X | X | X | X | X | X | | X | X | X | X | X | X | | |
| Expanded Clifton Court Forebay ^b | | | | | | | | | X | | | | | | | | |
| Intermediate forebay | | X | | | X | | | X | X | X | X | | | X | X | | |
| Primary Conveyance Facility | | | | | | | | | | | | | | | | | |
| Pipelines/tunnels | | X | | X | X | | X | X | X | X | X | | X | X | X | | |
| Canals | | | X | X | | X | X | | | | | X | X | | | | |
| Channels | X | | | | | | | | | | | | | | | X | |
| New operable barrier(s) | | | | | X | X | X | | X | | | | | | | X | |
| Fish movement and habitat corridor around Clifton Court Forebay | | | | | | | | | | | | | | | | X | |

^a *Byron Tract Forebay* currently refers to proposed forebays both north and south of Clifton Court Forebay.

^b *Expanded Clifton Court Forebay* refers to modifications to Clifton Court Forebay and expansion on Byron Tract 2.

^c For Alternative 9, these “intakes” refer to fish screens that would divert water into existing Delta channels (Georgiana Slough and the Delta Cross Channel).

- **Forebays**—an intermediate forebay would store water between intake facilities and other conveyance features depending on the alternative (Table ES-6). Byron Tract Forebay would enhance water supply operational flexibility, using forebay storage capacity to regulate flows from north Delta intakes and flows to south Delta pumping plants. Under Alternative 4, the existing Clifton Court Forebay would be expanded and divided to provide a transition between the new conveyance structures and the existing SWP/CVP south Delta export facilities.
- **Fixed and operable barriers**—would allow the passage of fish, water, and boats through existing Delta channels. Operable barriers would be constructed for the Through Delta/Separate Corridors alternative and those alternatives using Operational Scenarios B and H.
- **New levees or levee modifications**—would vary among the action alternatives and would protect new channel fill areas and serve modified channels and intake facility sites.
- **Culvert siphons**—would convey water under existing channels and between sections of canals (e.g., through tunnels) or other conveyance facilities.

- **Gates or similar control structures**—would control the flow of water through conveyance facilities and facilitate maintenance of conveyance structures under all action alternatives.
- **Concrete batch plants and fuel stations**—would be built and located side by side at various work sites to support construction under each action alternative. Each batch plant would also require a suitable source of clean water.
- **Temporary barge unloading facilities**—would be constructed at locations along the alternative alignments for the delivery of construction materials and would be removed following construction.
- **Other facilities**—new bridges to connect existing roads and highways, new access roads, improvements to local drainage systems affected by the alternatives, and other utilities improvements would be constructed to support the function of the new conveyance facilities.

ES.5.2.2 Operational Components/Scenarios

The BDCP would include modifying operations of SWP and CVP facilities in the Delta (covered activities and BDCP-associated federal actions). Each of the BDCP action alternatives would modify the existing operation of the SWP and CVP in the Delta to further protect fish populations and to accommodate new Delta facilities and proposed habitat restoration. The existing operation of the CVP and SWP in the Delta is determined by rules and objectives that guide daily Delta operational activities. Many of these rules are included in D-1641 (which implemented the 1995 Bay-Delta Water Quality Control Plan [WQCP] objectives). Several additional rules have been added by the 2008 USFWS BiOp and the 2009 NMFS BiOp for long-term operation of the CVP and SWP.

Operation of the SWP and CVP Delta facilities are guided by two main sets of rules that determine the maximum allowable exports and the minimum required Delta outflow. Several different objectives are used to govern the allowable exports, and several more objectives are used to control the minimum required Delta outflow. The proposed BDCP north Delta intakes would require a third category of Delta rules governing maximum allowable north Delta diversions. In some cases, rules governing south Delta exports would not apply to the north Delta intakes. Delta operations for each of the alternatives can be described and compared by the applicable rules under each category. The BDCP alternatives comprise a range of operational rules for the SWP/CVP in the Delta that add to, modify, or eliminate some of the existing Delta operational rules.

While meeting biological goals and objectives of the Plan, the applicable Delta operational rules evaluated for BDCP alternatives are intended to address how much of the Delta inflow can be exported at the south Delta CVP and SWP pumping plants; how much of the Delta inflow can be exported at the BDCP north Delta intakes; and how much of the inflow is needed for Delta outflow.

Addressing these three factors requires determining the most limiting (lowest) objective for south Delta exports, the most limiting (lowest) objective for north Delta intakes, and the most limiting (highest) objective for outflow. Because each alternative has a slightly different set of applicable rules with varying north Delta intake capacities, each BDCP alternative would have different Delta operations in many months.

Table ES-7 provides a summary of the major Delta objectives (rules) for determining the maximum allowable exports and the minimum required outflow under each BDCP alternative. The existing rules are included in the No Action Alternative operations. Each BDCP operational scenario includes

many of the No Action Alternative rules as well as several modified or new rules. The operational scenarios are described briefly below.

- Operational elements common to all scenarios include physical limits of SWP and CVP south Delta pumping plants, available San Luis Reservoir storage, SWP Article 21 delivery, seasonal SWP and CVP delivery patterns, minimum monthly specified outflow, maximum salinity for Delta diversions, and maximum Spring X2 location.
- Scenario A would include most No Action objectives for south Delta exports and required Delta outflow; however, Scenario A does not include Fall X2 objectives nor the San Joaquin River (SJR) Inflow/Export Ratio. Scenario A includes new criteria for north Delta diversion bypass flows and assumed operations of the proposed Fremont Weir (notch) during high Sacramento River flows. The minimum bypass flow ranges from 5,000 cfs to more than 15,000 cfs, depending on time of year. Scenario A was used in the CALSIM modeling for Alternatives 1A, 1B, 1C, and 3. Different north Delta diversion capacities would influence the volume of pumping from the south Delta, resulting in variation of Delta operations.
- Scenario B would include the Fall X2 criteria, but not the SJR Inflow/Export Ratio. Scenario B would also include less negative Old and Middle River (OMR) flow limits, and an operable barrier at the head of Old River. All other No Action rules were assumed to apply, and the north Delta intake bypass rules would be the same as those under Scenario A. Operational Scenario B was used in the CALSIM modeling for Alternatives 2A, 2B, and 2C.
- Scenario C would incorporate all the No Action rules. The north Delta intake bypass flow rules would be the same as those under Scenario A. Operational Scenario C was used in the CALSIM modeling for Alternative 5. The north Delta operations were limited because of the reduced conveyance capacity, entailing a single 3,000 cfs intake on the Sacramento River.
- Scenario D would eliminate use of the south Delta intakes (i.e., an isolated north Delta conveyance only) and would use the same north Delta intake bypass flow rules as those under Scenario A. None of the existing south Delta export rules would apply, including the export/import (E/I) ratio. All the No Action outflow rules would apply. Operational Scenario D was used in the CALSIM modeling for Alternatives 6A, 6B, and 6C.
- Scenario E would use north Delta bypass rules modified from those under Scenario A. Scenario E assumed less negative OMR limits and more restrictive SJR inflow/export ratios (December–March and June) and would eliminate south Delta exports in April and May. Scenario E would include all of the No Action outflow rules, including Fall X2. Operational Scenario E was used in the CALSIM modeling for Alternative 7.
- Scenario F would use the same rules as Scenario E, but would be modified to include specific Delta outflow criteria and cold water pool management criteria for specific reservoirs. Operational Scenario F was used in the CALSIM modeling for Alternative 8.
- Scenario G would include all the No Action rules for south Delta exports and Delta outflow, including the Fall X2 criteria. There would not be any north Delta bypass flow rules; diversions at the proposed fish screens on Delta Cross Channel (DCC) and Georgiana Slough would be controlled by tidal hydraulics and the DCC gate closure rules. Operational Scenario G was used in the CALSIM modeling for Alternative 9. All the south Delta export rules were applied for CALSIM modeling, though the SJR inflow/export ratio would not be required because the migrating SJR fish would be separated from the exports. The No Action OMR flow restrictions would apply.

1 Table ES-7. Comparison of Operational Rules under BDCP Operational Scenarios and Alternatives

| Operational Scenario Alternative | Applicable Months | No Action | Scenario A Alt 1 | Scenario B Alt 2 | Scenario A Alt 3 | Scenario H Alt 4 | Scenario C Alt 5 | Scenario D Alt 6 | Scenario E Alt 7 | Scenario F Alt 8 | Scenario G Alt 9 |
|--|----------------------|--------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Delta Operational Rules Controlling Maximum Allowable CVP and SWP South Delta Exports | | | | | | | | | | | |
| Physical/Permitted Limit for CVP (4,600 cfs) | Jan–Dec | X | X | X | X | X | X | X | X | X | X |
| Physical Limit for SWP (10,300 cfs) | Jan–Dec | X | X | X | X | X | X | X | X | X | X |
| Permitted Limit for SWP (6,680 cfs plus 1/3 of San Joaquin River Dec 15–March 15) | Jan–Dec | X | O | O | O | O | X | O | O | O | X |
| Export/Inflow Ratio (65% Jul–Jan; 35% Feb–Jun) | Jan–Dec | X | X ^a | X ^a | X ^a | X ^a | X ^a | O | X ^a | X ^a | X |
| SJR Inflow/Export Ratio | Apr–May | X | O | O ^b | O | O ^b | X | O | X ^c | X ^c | O ^d |
| Reverse Old and Middle River Flows | Dec–Jun | X | X | X ^e | X | X ^e | X | O | X ^f | X ^f | X |
| Available San Luis Reservoir Storage | Jan–Dec | X | X | X | X | X | X | X | X | X | X |
| SWP Article 21 Delivery (when San Luis Reservoir is Full) | Jan–Dec | X | X | X | X | X | X | X | X | X | X |
| Seasonal CVP and SWP Delivery Pattern | Jan–Dec | X | X | X | X | X | X | X | X | X | X |
| Delta Operational Rules Controlling Minimum Required Delta Outflow | | | | | | | | | | | |
| Minimum Monthly Specified Outflow | Jan–Dec | X | X | X | X | X | X | X | X | X ^g | X |
| Maximum Salinity (EC) for Delta Diversions | Jan–Dec | X | X | X | X | X | X | X | X | X | X |
| Maximum Spring X2 Location | Feb–Jun | X | X | X | X | X ^h | X | X | X | X | X |
| Maximum Fall X2 Location | Sep–Oct | X | O | X | O | X ^h | X | X | X | X | X |
| New Operational Rules Controlling Maximum North Delta Intake Diversions | | | | | | | | | | | |
| Maximum Capacity of North Delta Intakes (cfs) | N/A | None | 15,000 | 15,000 | 6,000 | 9,000 | 3,000 | 15,000 | 9,000 | 9,000 | None |
| Bypass Flows (% of Sacramento River at Freeport) | Jan–Dec | O | X | X | X | X | X | X | X | X | O |

2

3

1 Note for Table ES-7

Notes: "X" indicates that a BDCP alternative incorporates an operational rule. "O" indicates that a BDCP alternative does not incorporate that operational rule.

- ^a In computing the E/I ratio for these scenarios, the Sacramento River inflow is considered to be downstream of the north Delta intakes, with the exception of Scenarios H2 and H4, for which Sacramento River inflow was assumed to be upstream of the proposed north Delta intakes.
 - ^b Under these scenarios, a different strategy was applied to achieve similar objectives as the SJR I/E ratio.
 - ^c SJR I/E ratio is applicable December through June and therefore would apply for five months longer than under the No Action Alternative.
 - ^d SJR I/E ratio is applicable when the San Joaquin River flow at Vernalis is greater than 10,000 cfs.
 - ^e More restrictive/protective than Scenario A.
 - ^f More restrictive/protective than Scenario B.
 - ^g More restrictive/protective than in the No Action Alternative; the Delta outflow requirement is expressed as a percent of unimpaired flow.
 - ^h For Alternative 4, maximum Spring X2 Location will be determined based on the results of the decision tree process for spring outflow. Maximum Fall X2 Location will also be determined by the decision tree process under Alternative 4.
-

- Scenario H would include less negative OMR flow limits and an operable barrier at the head of Old River. All other No Action rules were assumed to apply except the SJR Inflow/Export Ratio, and the north Delta intake bypass rules would be the same as those under Scenario A. Delta Outflow under Scenario H would be determined by the outcome of the decision tree process needed to account for scientific disagreement and uncertainties related to spring outflow and Fall X2 requirements for delta and longfin smelt, salmonids, and sturgeon. Thus, there are different potential outflow requirements that could be used for spring and fall. Operational Scenario H was used in the CALSIM modeling for Alternative 4 and would include criteria for north Delta diversion bypass flows, south Delta OMR flows, south Delta E/I Ratio¹⁴, flows over Fremont Weir into Yolo Bypass by means of operable gates, Delta inflow and outflow, DCC gate operations (per D-1641 and the NMFS BiOp), additional Rio Vista minimum flow requirements, operations for Delta water quality and residence (per D-1641), and water quality for agricultural and municipal/industrial diversions (per D-1641).
- Each of the BDCP operational scenarios can be compared with the assumed No Action Delta operational rules listed in Table ES-7. Delta operations are the combination of the Delta inflow, the assumed Delta operational rules, and the assumed capacity and bypass flow rules for the new BDCP facilities.

ES.5.2.3 Habitat Components

A primary conservation goal of the BDCP is to protect, restore, enhance, and manage tidal, riparian, and seasonally inundated floodplain habitats for the benefit of covered fish, wildlife, and plant species and ecosystem processes in the Plan Area. Habitat restoration, enhancement, and management activities are covered activities under the BDCP; they include all actions that may be undertaken to implement the physical habitat conservation measures CM2–CM11.

Each of the action alternatives would include implementation of protection, restoration, enhancement, and management activities, as summarized below.

- Protection, restoration, and enhancement of the following natural community/habitat types would be undertaken under all action alternatives: freshwater and brackish tidal, subtidal, and transition habitats; seasonally inundated floodplain; channel margin; riparian habitat; grassland communities; vernal pool complex; alkali seasonal wetland complex; managed seasonal wetland; nontidal perennial emergent wetland and nontidal perennial aquatic; and cultivated lands. Target acreages would vary for some alternatives, as indicated in Table ES-8.
- Management plans would be prepared and implemented for protected natural communities and covered species that occupy those communities. The following natural communities would receive protection, restoration, creation, and enhancement, and would be incorporated into a conservation reserve system: tidal perennial aquatic, tidal mudflat, tidal brackish and emergent wetland, tidal freshwater emergent wetland, valley/foothill riparian, grassland, nontidal freshwater perennial emergent wetland, nontidal perennial aquatic habitat, alkali seasonal wetland complex, vernal pool complex, and managed wetland. Although not considered a natural community, cultivated lands are nonetheless a part of the BDCP conservation strategy because, in certain instances, they provide value as habitat for covered species.

¹⁴ In computing the E/I ratio for Scenarios H1 and H3, the Sacramento River inflow is considered to be downstream of the north Delta intakes. However, in computing the E/I ratio for Scenarios H2 and H4, the Sacramento River inflow was assumed to be upstream of the proposed north Delta intakes.

The habitat conservation components and variations among the alternatives are presented in Table ES-8.

Table ES-8. Comparison of Conservation Component Acreages and Variations among the Action Alternatives

| Conservation Component | Variations |
|--|---|
| 65,000 acres of restored tidal perennial aquatic, tidal mudflat, tidal freshwater emergent wetland, and tidal brackish emergent wetland natural communities within the BDCP ROAs (CM4). | Alternative 5, 25,000 acres instead of 65,000 acres of tidal habitat would be restored. Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen. |
| 10,000 acres of seasonally inundated floodplain habitat within the north, east, and/or south Delta ROAs (CM5). | Alternative 7, 20,000 rather than 10,000 acres of seasonally inundated floodplain would be restored to further improve fish and wildlife habitat, particularly along the San Joaquin River. Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen. |
| 20 linear miles of channel margin habitat enhancement in the Delta (CM6). | Alternative 7, 40 rather than 20 linear miles of channel margin habitat would be enhanced. Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen. |
| 5,000 acres of restored native riparian forest and scrub habitat (CM7). | Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen. |
| 2,000 acres of restored grassland and 8,000 acres of protected or enhanced grassland within BDCP CZs 1, 8, and/or 11 (CM8 and CM3). | Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen. |
| Up to 67 acres of restored vernal pool complex and 72 acres of restored alkali seasonal wetland within CZs 1, 8, and/or 11 (CM9), 600 acres of protected vernal pool complex within CZs 1, 8, and/or 11 (CM3). | Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen. |
| 1,200 acres of restored nontidal marsh within CZs 2 and 4 and/or 5, and the creation of 320 acres of managed wetlands (CM10). | Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen. |
| 50 acres of protected nontidal marsh (CM3). | Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen. |
| 150 acres of protected alkali seasonal wetland complex in CZs 1, 8, and 11 (CM3 and CM11). | Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen. |
| 1,500 acres of protected managed wetlands (CM3 and CM11). | Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen. |
| 5,000 acres of protected managed wetland natural community (CM3). | Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen. |
| 45,405 acres of cultivated land (non-rice) and up to 1,500 acres of cultivated land (rice) protected (CM3 and CM11). | Alternative 9, similar but expected different locations for restoration or enhancement activities could be chosen. |

ES.5.2.4 Reduction of Other Stressors

The BDCP has identified several issues, beyond water exports and habitat conditions, that affect the survival of covered fish species in the Delta. These *other stressors* include but are not limited to exposure to contaminants, competition, predation and other changes to the ecosystem caused by nonnative species, entrainment at water intake pumps not operated by the SWP and CVP, and fish passage. BDCP will implement measures intended to address the effects of other stressors (CM12–CM21; Table ES-3) as part of the Plan under all alternatives except the No Action Alternative¹⁵.

- Control of methylmercury load (methylation of inorganic mercury) in BDCP habitat restoration areas.
- Control of nonnative submerged and floating aquatic vegetation in BDCP tidal habitat restoration.
- Improvement of dissolved oxygen levels in the Stockton Deep Water Ship Channel (DWSC) when covered species are present.
- Temporary reduction of local effects of predators on covered fish species.
- Installation of nonphysical barriers to improve survival of emigrating juvenile salmonids at channel junctions.
- Funding of efforts to reduce illegal harvest of covered fish species.
- Establishment of new and expansion of existing conservation propagation programs for delta smelt and longfin smelt.
- Funding of efforts to treat pollutant runoff from urban stormwater.
- Support of current efforts to reduce the risk of introduction of invasive species by recreational vessels.
- Support for installation of screens and alteration of nonproject diversions, as appropriate, to reduce the risk of entrainment of covered fish species.

ES.5.2.5 Avoidance and Minimization Measures

CM22 Avoidance and Minimization Measures entails incorporation of measures into BDCP activities to avoid or minimize direct take of covered species and minimize impacts on natural communities that provide habitat for such species. Examples of these measures include measures to avoid erosion, sedimentation, and contaminant spills. These measures are largely intended to address the effects of constructing water conveyance facilities and restoration activities.

In addition, the BDCP includes adaptive management and monitoring programs. Various types of monitoring activities would be conducted during BDCP implementation: construction monitoring, compliance monitoring, effectiveness monitoring, and system monitoring.

¹⁵ Between the BiOps, specific species' Recovery Plans, and the federal and state regulatory agency actions that monitor some of the other stressors listed (e.g., invasive species control, stormwater runoff), the No Action Alternative could involve reduction of several of these other stressors; however, it would be speculative to assess which would be substantively addressed and to what extent.

ES.6 Public Involvement

ES.6.1 EIR/EIS Scoping Meetings

Scoping is a public participation element of CEQA and NEPA that is intended to assist the lead agencies preparing an EIR/EIS with determining the topics that the document should address. The scoping process invites public comment during a public review period. Comments received during the public scoping process are considered in the preparation of the EIR/EIS. The EIR/EIS Lead Agencies conducted a total of 22 public scoping meetings throughout California during 2008 and 2009 to gather public input on the scope of the EIR/EIS and to involve stakeholders, other agencies, as well as the public early in the decision-making process to identify issues and concerns to examine in the preparation of the EIR/EIS.

On January 24, 2008, USFWS and NMFS issued a Notice of Intent (NOI) to prepare an EIS. A second NOI was issued on April 15, 2008, to include Reclamation as a federal co-lead agency, update the status of the planning process, and provide updated information related to scoping meetings. On March 17, 2008, DWR issued an NOP. The March 17, 2008, NOP and the April 15, 2008, NOI identified scoping meeting locations and stated that written comments would be accepted until May 30, 2008.

At the time of the publication of the NOP and NOI in 2008, the BDCP was in development, and information related to the alternatives to be considered in the EIR/EIS was not available. Additional information was developed to describe the BDCP, and subsequent scoping activities were initiated on February 13, 2009, with the publication of a second NOP and a third NOI. The second NOP and third NOI identified scoping meeting locations and stated that written comments would be accepted until May 14, 2009.

ES.6.2 Public Outreach Activities

In addition to the formal scoping meetings, other opportunities to involve the public in the environmental review process included Steering Committee meetings from 2006 to 2010; public workshops in 2009; working group meetings and public information meetings in 2011; and ongoing briefings, presentations, and meetings with interested stakeholders throughout BDCP development.

ES.6.2.1 BDCP Steering Committee and Working Groups

From 2006 through 2010, the BDCP planning process was guided by a Steering Committee consisting of representatives of many agencies and stakeholder organizations. All Steering Committee meetings were open to the public, and all presentations and documents discussed at the meetings were available on the BDCP website. Both oral and written public comments were accepted, and comments received in writing were posted to the website.

Throughout the process, various working groups and technical teams were convened to develop technical information or recommendations about aspects of the BDCP for consideration by the Steering Committee. Technical teams were tasked with developing proposed approaches to technical and scientific issues. These teams were co-chaired by subject experts and were staffed by appropriate technical experts. Meetings of the working groups and technical teams were noticed on the BDCP website and open to the public.

1 **ES.6.2.2 Stakeholder Briefings and Presentations**

2 Over the course of the planning process, representatives of the BDCP have conducted more than
 3 250 briefings for community organizations, local jurisdictions in and adjacent to the Plan Area,
 4 elected officials, environmental organizations, urban and agricultural water user groups,
 5 recreational and commercial fishing organizations, and professional conferences or association
 6 meetings. These public presentations were made throughout the state, and information about the
 7 BDCP was regularly distributed, including updated fact sheets explaining the purpose of the Plan
 8 and describing its various components.

9 **ES.6.2.3 Public Meetings**

10 There have been numerous public meetings associated with the development of the BDCP at
 11 different milestones in the planning process to share information and solicit input. These meetings
 12 included town hall meetings in the Delta; landowner meetings to discuss required field studies
 13 needed to support the environmental review process; a webinar broadcast; informational sessions
 14 about the purpose, approach, and status of the BDCP; public workshops to review the Draft BDCP
 15 Conservation Strategy; and public meetings throughout 2011 and 2012. Public meetings served to
 16 discuss the progress of the working groups that were established earlier in the year; update
 17 stakeholders on issues being resolved and incorporated into the BDCP; provide information on
 18 elements of the administrative draft EIR/EIS, the BDCP Effects Analysis, the decision tree analysis
 19 related to the preliminary proposal, biological goals and objectives, and funding; and to provide an
 20 opportunity for public comment and questions. In addition, additional public meetings were held in
 21 2013 to provide briefings on BDCP developments.

22 **ES.6.2.4 Environmental Justice**

23 During preparation of the EIR/EIS, public outreach activities were conducted that considered
 24 minority and low-income populations. These activities included but were not limited to preparing a
 25 draft environmental justice plan to guide public outreach activities directed at minority and low-
 26 income populations; conducting translated scoping meetings within affected communities during
 27 evening hours in an effort to involve low-income and minority communities outside of working
 28 hours; providing a multilingual information hotline for project information; and conducting a survey
 29 to assess possible impacts of the BDCP and to identify future outreach opportunities.

30 **ES.6.2.5 Additional and Ongoing Public Participation Opportunities**

31 The BDCP proponents maintained a project website that was updated regularly with information
 32 about upcoming meetings; documents of interest, including preliminary draft chapters of the
 33 EIR/EIS; announcements; and project schedule information. Numerous fact sheets and brochures
 34 were developed for the BDCP and distributed to stakeholders at public meetings or project briefings.

35 Additional public participation opportunities will continue during preparation of the EIR/EIS,
 36 including public meetings to receive formal comments on the Draft EIR/EIS, and during other
 37 activities conducted in association with the BDCP.

38 **ES.6.2.6 Public Review of the Draft EIR/EIS**

39 The public Draft EIR/EIS will be available for review and comment following the filing of the Notice
 40 of Availability of the EIS with EPA and the Notice of Completion of the EIR with the California State

Clearinghouse. The purpose of public review of the Draft EIR/EIS is to receive comments from interested parties on the document's completeness and adequacy in disclosing potential environmental impacts of the BDCP and alternatives. After the close of the public comment period for the Draft EIR/EIS, a Final EIR/EIS will be prepared containing responses to public and agency comments on the Draft EIR/EIS and explanations regarding how they were addressed. DWR is responsible for certifying the EIR as adequate by issuing a Notice of Determination in compliance with CEQA. Reclamation, NMFS, and USFWS are each responsible for making a decision on the proposed action and preparing a Record of Decision in compliance with NEPA. The agencies will use the BDCP EIR/EIS, ESA Section 7 consultations, and other appropriate information to make a decision on selecting which alternative to implement regarding approval of the BDCP and issuance of the ITPs.

ES.7 Areas of Known Controversy and Issues to be Resolved

NEPA and CEQA require that the lead agencies identify areas of known controversy and issues to be resolved (NEPA) that have been raised during the scoping process and throughout the development of alternatives in the EIR/EIS. Based on input from agency representatives and the general public during public scoping, the following issue areas, several of which are controversial, have been identified.

- **Range of Alternatives.** Because of the nature of water-related issues in California, the selection of a suitable range of alternatives for analysis in the EIR/EIS is an issue of concern to the public as well as to governmental agencies.
- **Biological Resources.** The complexity of the BDCP raises many concerns over environmental consequences for the aquatic ecosystem and fish species, and for the terrestrial ecosystem and plant and wildlife species. These include the effects of changes in existing land uses and habitats; the interrelationship between the BDCP and other HCPs and NCCPs; and the potential disparity between restored habitats and historical conditions, which could result in adverse effects on sensitive resources, including covered species.
- **Biological Goals and Objectives.** Controversy exists related to the potential conflict between conservation goals and the reasonable use of natural resources and lands for economic development. The BDCP sets out extensive biological goals and objectives, including specific measurable targets developed on the basis of the best available scientific information. These goals and objectives have been developed through a collaborative effort between state and federal agencies, local governments, community groups, and private interests, all of whom bring varying interests and concerns.
- **Water Supply, Surface Water Resources, and Water Quality.** Water supply and surface water resources—key drivers for development of the BDCP—remain highly controversial issues for a wide array of stakeholders (e.g., agricultural interests, hunting and fishing interests, water agencies, local jurisdictions) because of the changes in water operations, surface water flow conditions, and diversions that could result from changes to the SWP and CVP systems. Water quality is an issue of concern because of uncertainties regarding activities associated with conveyance facilities and restored habitat that could lead to discharge of sediment, possible

changes in salinity patterns, and water quality changes that could result from modifications to existing flow regimes.

- **Flood Management.** Flood management is a potentially controversial issue because implementation of the BDCP would entail modification of some existing levees as well as changes in flow regimes and other changes, including habitat restoration in the Yolo Bypass.
- **Agricultural Resources.** Because the Plan Area is largely devoted to agricultural uses, the effects of the BDCP on existing agricultural activities constitute an issue of known controversy. In addition to conversion of agricultural lands to other uses (i.e., water conveyance facilities and restored/enhanced natural habitat areas), there are concerns that conflicts could arise between continuing agricultural operations and management requirements in areas targeted for conservation actions (e.g., changes in cultivation or pest management practices).
- **Socioeconomics.** The key socioeconomic concerns involve the potential for loss of revenue and employment associated with the decrease in agricultural production stemming from conversion of agricultural land to other uses, as well as the potential decrease in tax revenues due to such a decline in agricultural activities.
- **Regional Economic Resources.** Like socioeconomic concerns, regional economic issues are controversial. In addition to the concerns discussed above, these concerns address a wider geographic scope and involve such issues as the preclusion of future development in areas of the Delta that are protected in ROAs associated with implementation of the BDCP, as well as the costs of implementation and the potential loss of revenues to local jurisdictions. The potential for operable barriers and gates to divert recreation away from the Delta and affect businesses related to recreational boating and fishing marinas is an issue of concern.
- **Recreation.** Concerns relating to recreation include potential conflicts between construction and operation of facilities associated with the BDCP and ongoing Delta recreational activities (e.g., boating, fishing, hunting, enjoyment of marinas). In addition, there are concerns about possible conflicts between operable barriers and gates in Delta waterways and recreational boating corridors.
- **Mosquitoes and Other Hazards.** Public health hazards—particularly those associated with mosquitoes—must be addressed because of concerns that increased areas of natural habitat, especially those associated with periodic inundation, could lead to an increase in breeding habitat for mosquitoes as well as habitat for rodents and other wildlife species and, consequently, to an increase in potential disease vectors.
- **Aesthetics/Visual Resources.** Potential effects on aesthetics/visual resources are controversial to area residents; these concerns focus largely on the proposed intake facilities and the power transmission facilities necessary to support them and, to a lesser degree, on new canals that are proposed under some of the alternatives.
- **Growth.** One of the BDCP objectives is to increase water supply reliability to SWP and CVP contractors south of the Delta. Increasing the reliability of water may allow additional growth south of the Delta or in export service areas. Concerns regarding the growth-inducing consequences of the BDCP generally focus on the potential effects of increased water supply to the southern part of the state.
- **Community Issues.** Community issues, such as construction noise, air quality, and traffic circulation effects; conversion of existing land uses; and access to private lands have been

controversial topics. Plans by DWR to conduct geotechnical drilling surveys were opposed by the local Farm Bureaus because of concerns over confidentiality of the survey results, and the eminent domain process is currently underway to allow acquisition of temporary entry rights on private land for survey work. Although population densities in the Plan Area are relatively low, existing farms and agricultural enterprises could be permanently divided, jeopardizing the ability of that land to continue serving productive agricultural uses. Residences, schools, religious institutions, and other sensitive community land uses could be disrupted by the BDCP during the 9-year-long construction period.

ES.8 Effects of the Alternatives

The EIR/EIS describes the potential temporary and permanent direct and reasonably foreseeable indirect effects of implementing the 16 alternatives, including the No Action Alternative, on human, physical, and biological resources in the project area. This section identifies those resource areas that were determined relevant for evaluation of the alternatives; describes the CEQA and NEPA baselines; and explains the impact analysis, mitigation measures, and CEQA and NEPA analysis conclusions.

ES.8.1 Resource Areas

Individual chapters of the EIR/EIS provide the results of the evaluations of the effects of implementing the BDCP conservation measures on 25 resource areas under all alternatives. Topics addressed are those determined to be relevant to the evaluation of the alternatives under CEQA and/or NEPA because implementing one of the alternatives would result in one or more effects on that resource. The resource areas are listed below in the order in which they appear in the document.

- Water Supply
- Surface Water
- Groundwater
- Water Quality
- Geology and Seismicity
- Soils
- Fish and Aquatic Resources
- Terrestrial Biological Resources
- Land Use
- Agricultural Resources
- Recreation
- Socioeconomics
- Aesthetic and Visual Resources
- Cultural and Historic Resources

- Transportation
- Public Services and Utilities
- Energy
- Air Quality and Greenhouse Gas Emissions
- Noise
- Hazards and Hazardous Materials
- Public Health
- Mineral Resources
- Paleontological Resources
- Environmental Justice (NEPA only)
- Climate Change
- Growth Inducement and Other Indirect Effects

For some resource topics, the types of changes anticipated as a result of implementing one of the alternatives would occur only in one of the defined geographic regions that make up the overall project area; for other resource topics, changes would take place in more than one region (i.e., Upstream of the Delta, Delta [corresponding to the Plan Area and Areas of Additional Analysis], or SWP and CVP Export Service Areas) (see ES.3, *Project Location*). The rationale for evaluating specific geographic regions is based on the extent to which the alternatives would affect the specific resource topic and are discussed in the introductory Environmental Setting section of each resource chapter. The study area defined in the setting for each resource considers the geographic areas that could be affected by implementation of all the alternatives.

ES.8.2 CEQA and NEPA Baselines

Because CEQA and NEPA have different directives related to using a baseline for determining the impacts of the action, two baselines have been established for the impact analyses: one for determining the impacts of state and local agency actions under CEQA and one for determining the impacts of federal actions under NEPA. The CEQA baseline for assessing the significance of impacts of any proposed project is normally the environmental setting, or existing conditions, at the time an NOP is issued (State CEQA Guidelines Section 15125[a]). This directive was recently interpreted and applied by the California Supreme Court¹⁶. According to the court, “[t]he CEQA Guidelines establish the default of an existing conditions baseline even for projects expected to be in operation for many years or decades.” (Id. at p. 16.) “[E]xisting conditions constitute the norm from which a departure must be justified—not only because the CEQA Guidelines so state, but because using existing conditions serves CEQA’s goals in important ways.”

The CEQA baseline employed in this EIR/EIS is consistent with the principles outlined above. Following CEQA Guidelines section 15125(a), the CEQA baseline is developed to assess the significance of impacts of the alternatives in relation to the existing conditions at the time of the NOP. The Existing Conditions assumptions for the BDCP EIR/EIS include facilities and ongoing programs that existed as of February 13, 2009 (publication date of the most recent NOP and NOI to

¹⁶ *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority* (2013) 57 Cal.4th_439.

prepare an EIR/EIS), that could affect or could be affected by implementation of the BDCP alternatives.

Certain baseline assumptions were updated within the CEQA lead agency's reasonable discretion. For example, the June 2009 BiOp for salmonid species from NMFS was included within the CEQA baseline even though it had not been issued in its final form as of February 2009. Because the December 2008 BiOp for the delta smelt from the USFWS was in place as of February 2009, it made sense to also include the NMFS BiOp, which had been released in draft form prior to February 2009. DWR decided that it would have been anomalous to rely on the most current USFWS BiOp with respect to delta smelt issues, but to ignore the soon-to-be-adopted NMFS BiOp with respect to salmonid issues.

Even so, because of the importance of focusing on existing conditions, DWR as CEQA lead agency did not assume full implementation of *all* aspects of either BiOp. In particular, DWR did not assume full implementation of a particular requirement of the delta smelt BiOp, known as the *Fall X2* salinity standard, which in certain water year types can require large upstream reservoir releases in fall months of wet and above normal years to maintain the location of Fall X2 at approximately 74 or 81 river kilometers inland from the Golden Gate Bridge. As of spring 2011, when a lead agency technical team began a new set of complex computer model runs in support of the EIR/EIS, DWR determined that full implementation of the Fall X2 salinity standard as described in the 2008 USFWS BiOp was not certain to occur within a reasonable near-term timeframe because of a recent court decision and reasonably foreseeable near-term hydrological conditions. As of that date, the United States District Court in litigation filed by various water users over the delta smelt BiOp determined that it had failed to sufficiently explain the basis for Fall X2, and its implementation was uncertain in the foreseeable future. This uncertainty, together with CEQA's focus on existing conditions, led to the decision to use a CEQA baseline without the implementation of the Fall X2 action in CEQA assumptions and analyses in the draft EIR/EIS. However, for NEPA purposes, which uses a different method for assessing environmental effects of the action alternatives, the Fall X2 action is included in the NEPA point of comparison.

Consistent with the considerations of the CEQA baseline, Existing Conditions for the BDCP EIR/EIS include continuation of operations of the SWP and CVP by DWR and Reclamation, respectively. Assumptions for the Existing Conditions related to operations of the SWP and CVP are described in the *Biological Assessment on the Continued Long-term Operations of the Central Valley Project and the State Water Project* (August 2008) prepared by Reclamation (2008) as modified by certain elements of the June 2009 NMFS BiOp and the December 2008 USFWS BiOp that would be expected to occur even in the absence of the proposed project.

Neither NEPA nor the CEQ Regulations for implementing NEPA contain a specific directive for using a baseline for determining an action's significant effects on the quality of the human environment. CEQ's *Forty Most Asked Questions Concerning CEQ's NEPA Regulations* provides that the no action alternative may be used as a "benchmark, enabling decision makers to compare the magnitude of environmental effects of the action alternatives." Under NEPA, federal agencies have the discretion to define the point of comparison for assessing environmental effects of the alternatives as the no action alternative. Accordingly, the NEPA portion of this EIR/EIS uses the No Action Alternative as the point of measurement for determining impacts of the federal action under NEPA. The No Action Alternative, sometimes referred to as the *future no action condition*, considers No Action to include continuation of operations of the SWP and CVP as described in the 2008 USFWS and 2009 NMFS BiOps and other relevant plans and projects that would likely occur in the absence of BDCP actions.

NEPA requires the evaluation of the potential effects of alternatives in comparison with the likely future No Action condition from the time that proposed actions are implemented and/or become operational. Because nothing in NEPA or NEPA case law precludes NEPA lead agencies when using No Action scenarios as the point of comparison from including anticipated future conditions in the impact assessment, the No Action Alternative, unlike the CEQA baseline, assumes implementation of the Fall X2 salinity standard as described in the 2008 USFWS BiOp, as well as changes due to climate change that would occur with or without the proposed action or alternatives.

ES.8.3 Impacts, Mitigation Measures, Conclusions

The Environmental Consequences section of each resource chapter presents the impacts, mitigation measures, and conclusions of the NEPA and CEQA analyses. The overall framework common to the Environmental Consequences section of each resource chapter is organized to describe the methods of analysis, determination of effects, the effects and mitigation approaches, and cumulative effects.

- *Methods of Analysis* explains the specific analytical approaches or variations used, including modeling, simulations, or other analytical tools, to perform the evaluation of the specific resource topic. It describes how the potential effects associated with construction and operation of the alternatives are determined.
- *Determination of Effects* describes the criteria for determining whether an impact is beneficial, adverse, or not adverse under NEPA and significant under CEQA. For purposes of the CEQA impact analysis, these sections primarily incorporate the State CEQA Guidelines Appendix G criteria or other established thresholds and provide further explanation of how the analyses use these criteria to make a determination with regard to whether an effect is significant. For NEPA, these criteria are used to provide general guidance on determining if NEPA effects are beneficial, adverse, or not adverse.
- *Effects and Mitigation Approaches* presents each alternative and provides a discussion of potential temporary, permanent, direct, and indirect effects of implementing the BDCP conservation measures on the resource and identifies any environmental commitments that would reduce the level of the effect. The section also identifies mitigation approaches to further avoid, reduce, or compensate for adverse effects that remain after implementation of relevant environmental commitments. Pursuant to CEQA requirements, each impact discussion includes a *CEQA Conclusion* that states the significance of the impact prior to mitigation, identifies mitigation if a significant impact would occur, and states the residual level of impact after incorporation of the identified mitigation measure(s). Refer to Sections ES.8.3.1, *Impacts*, ES.8.3.2, *Mitigation Measures*, and ES.8.3.3, *Conclusions*, for additional discussion on these topics.
- *Cumulative Effects*, addresses the potential for the alternatives to act in combination with other past, present, and probable future projects or programs to create a cumulatively significant adverse impact.

ES.8.3.1 Impacts

Under NEPA, the purpose of an EIS is to describe and disclose the effects of the alternatives and determine whether the project “as a whole” would have an adverse effect on the environment. Under CEQA, the significance of each individual impact must be described. A “significant effect on the environment” is defined as a substantial, or potentially substantial, adverse change in the environment (CEQA Public Resources Code Section 21068). Therefore, to facilitate both CEQA and

NEPA reviews, the Environmental Consequences sections analyze each action alternative and compares it against both the No Action Alternative (for NEPA purposes—the NEPA baseline) and the Existing Conditions (for CEQA purposes—the CEQA baseline) and describe potential resource-specific impacts and whether those effects would be adverse (see Section ES.8.2, *CEQA and NEPA Baselines*). In addition, for CEQA adequacy, the resource analyses indicate a threshold of significance; identify mitigation that would reduce significant impacts, when available and feasible; and provide a statement of each impact’s significance before and after mitigation (conclusion).

The No Action Alternative is presented first and is followed by the analyses of the action alternatives. Many of the action alternatives have identical or very similar effects on the resources. Accordingly, the Environmental Consequences sections present detailed analyses of certain alternatives that have varying effects due to substantial differences between the alternatives (e.g. water conveyance footprints, operational rules). Then, where appropriate, discussions of other alternatives reference these analyses and conclusions where the effects are the same as or similar to those previously assessed alternatives. This approach allows the presentation of effects to minimize redundancy to the extent possible and emphasize aspects of the alternatives that differ from the effects of the alternatives described in greater detail. Therefore, it is recommended that to gain a better understanding of the impacts and mitigation for the alternatives described in lesser detail, readers should first become familiar with the presentation of impacts and mitigation for the alternatives described in greater detail.

Impacts are numbered consecutively beginning with Impact TOPIC-1 for each alternative. The impact identification is composed of an abbreviation specific to the resource topic and the corresponding number; for example, the discussion of the first land use impact under each alternative would be “Impact LU-1” with a title defining the general nature of the impact being addressed. In most resource chapters, the same impacts are evaluated for all alternatives. The discussion of cumulative effects is presented in a separate standalone section following Alternative 9 and has separate impact numbers continuing the sequence from the last impact evaluated under the alternatives.

The analysis of each impact follows the same basic structure; lengthier discussions may be further divided with subheadings. Each impact discussion first addresses the NEPA analysis, using the appropriate terminology for presence or absence of adverse effects. This analysis is followed by a CEQA conclusion, which is identified as such. The CEQA conclusion typically relies on the NEPA analysis and provides additional discussion if appropriate to further explain the CEQA conclusion. The CEQA conclusion uses the terminology appropriate to describing the presence or absence of significant impacts, identifies mitigation measures, and makes a statement regarding the level of significance of the impact after mitigation is incorporated.

For some resource areas, certain impacts may be further divided into two timeframes for analysis—near-term and late long-term; these subheadings then appear in both the NEPA and the CEQA analyses. The near-term effects, which would occur over the first 10 years of BDCP implementation, are addressed separately because they relate primarily to construction of the BDCP water conveyance facilities. The late long-term effects are those associated with all actions that would occur over the 50-year timeframe of the BDCP; these effects are analyzed at a program level.

The basic structure of the individual impact is as follows.

Impact TOPIC-1: Effects of water operations on component of resource topic

General statement about the effect of the alternative on the resource topic relative to the NEPA baseline followed by the detailed analysis of the impact on the resource topic.

NEPA Effects: Summary of analysis and NEPA determination regarding whether the effect would be beneficial, adverse, or not adverse.

CEQA Conclusion: Statement about the significance of the impact of the alternative relative to the CEQA baseline.

Summary of analysis and CEQA conclusion before mitigation; identification of mitigation when the impact is significant; and conclusion regarding impact significance after mitigation.

This discussion is followed by a list of mitigation measures for any significant impacts identified in the analysis.

ES.8.3.2 Mitigation Measures

Specific mitigation measures are proposed when necessary to avoid, minimize, rectify, reduce or eliminate, or compensate for impacts of the alternatives on the environmental resource areas. Mitigation is presented to meet CEQA's specific requirement that whenever possible, agency decisionmakers adopt feasible mitigation available to reduce a project's significant impacts to a less-than-significant level. Although NEPA does not impose a similar procedural obligation on federal agencies, this practice is consistent with NEPA's intent that mitigation be discussed in sufficient detail to ensure that environmental consequences have been fairly evaluated.

Frequently, a mitigation measure developed for one resource would also reduce the level of impact on another resource. Instead of developing redundant measures, the resource chapters provide cross-references to specific mitigation measures that have been developed for another resource area but that would also serve to address the impact identified. For example, the Transportation analysis identifies a specific mitigation measure that requires preparation of site-specific traffic management plans to be implemented to reduce potential significant impacts caused by construction-related traffic. This measure serves to mitigate effects on a number of additional resource topics such as land use, recreation, public services and utilities, and hazards and hazardous materials, and is identified as such in those individual chapters.

The discussion of mitigation measures includes identification of the entity or entities responsible for ensuring that the measure is carried out as specified. Typically, this responsibility is assigned to "BDCP proponents." This term should be understood to mean different entities in different contexts. All construction activities associated with CM1 will be the responsibility of DWR. With respect to water operations-related conservation measures, DWR and Reclamation will implement all actions associated with CM1 and water operations aspects of CM2, consistent with their existing responsibilities and authorities. In general, mitigation related to restoration and other activities in CM3–CM22 will be the responsibility of a larger group of agencies as set forth in relevant portions of the BDCP. Responsibilities for particular measures will be described in the Mitigation Monitoring and Reporting Program to be issued in connection with the Final EIR/EIS.

1 **ES.8.3.3 Conclusions**

2 The requirements for the discussion of impacts and identification of mitigation measures differs
 3 between NEPA and CEQA. In some instances, the NEPA analyses and CEQA conclusions differ for a
 4 particular impact discussion because the NEPA and CEQA baselines or points of comparison for the
 5 impact analyses use different timeframes (see Section ES.8.2, *CEQA and NEPA Baselines*).
 6 Additionally, the requirements for a final statement or conclusion regarding the level of effect
 7 (under NEPA) or significance of an impact (under CEQA) are different. The NEPA analyses include a
 8 statement regarding whether the effect being discussed would be adverse, not adverse, or beneficial.
 9 If an effect is identified as adverse, the discussion identifies any mitigation measures that are
 10 available to reduce the severity of the effect and provides a discussion of each of the mitigation
 11 measures. In some instances, these mitigation measures are specific to another resource topic and a
 12 summary of the measure is provided with a cross-reference to the appropriate resource chapter for
 13 the full description. NEPA also requires the identification of any adverse environmental effects that
 14 would still occur despite mitigation. As discussed below, the CEQA discussion identifies impacts that
 15 cannot be fully mitigated and concludes that the residual impact is significant and unavoidable.

16 Following the NEPA analysis, a *CEQA Conclusion* is provided. This section summarizes the key impact
 17 mechanisms discussed in the preceding NEPA analysis and identifies the level of significance of the
 18 impact related to the specific impact criteria or thresholds of significance identified in the *Determination*
 19 *of Effects*. This determination of significance considers full implementation of relevant Environmental
 20 Commitments as part of implementing the alternative. If the impact is less than significant, the analysis
 21 makes this conclusion and states that no mitigation is required. If the identified impact is significant,
 22 then the CEQA discussion identifies the specific mitigation measures that should be implemented to
 23 reduce the impact to a less-than-significant level. These mitigation measures may be specific to an
 24 individual resource chapter or, as discussed above, may be in the form of a cross-reference to mitigation
 25 measures developed in another chapter. If the mitigation measures would fully mitigate the identified
 26 impact, the conclusion states that the residual impact (the impact remaining after mitigation) would be
 27 less than significant. In instances where the impact cannot be fully mitigated, the discussion explains
 28 this and concludes that the residual impact is significant and unavoidable. The full list of mitigation
 29 measures relevant to a specific impact are provided following the discussion of the *CEQA Conclusion*.

30 **ES.9 Comparisons of the Alternatives**

31 This section provides a general overview of the key differences in the types and degree of potential
 32 effects between the BDCP alternatives, including the No Action Alternative, by general resource area
 33 types or categories (i.e., water-, land-, and air-based). In addition, Table ES-9 summarizes, by
 34 resource area, the environmental impacts/effects of implementing the BDCP alternatives, any
 35 mitigation to reduce significant impacts, and their level of significance after mitigation.

36 **ES.9.1 Water-Based Resources and Impact Mechanisms**

37 **ES.9.1.1 Comparison of Water Flow Differences for BDCP Alternatives**

38 Each of the BDCP action alternatives includes assumed changes in the existing operation of the CVP
 39 and SWP in the Delta to further protect fish populations and to accommodate new Delta facilities
 40 and proposed habitat restoration. The existing operation of the CVP and SWP in the Delta is

determined by rules and objectives that guide daily Delta operational activities. Many of these rules are included in D-1641 (which implemented the 1995 Bay-Delta Water Quality Control Plan [WQCP] objectives). Several additional rules have been added by the 2008 USFWS BiOp and the 2009 NMFS BiOp for long-term operation of the CVP and SWP. The existing operation of the CVP and SWP in the Delta is briefly summarized here, so that the modifications to these existing (and Future No Action) operations (rules) can be identified for the BDCP action alternatives.

Currently, several different operational criteria influence exports and Delta outflow. The proposed BDCP north Delta intake operations would include additional rules governing allowable north Delta diversions. The BDCP alternatives would require additions to, modification of, or elimination of some of the existing Delta operational rules, as described in further detail below. Changes in the operational rules may cause changes in the Delta channel flows, outflows and exports, and may require changes in the SWP upstream reservoir releases and reservoir storage. Because each alternative has a slightly different set of applicable rules (Table ES-10) and varying north Delta intake capacities, each BDCP alternative would have slightly different Delta operations in many months. Although the monthly Delta inflows, Delta channel flows, Delta outflow, and Delta exports may be slightly different for each BDCP alternative (as simulated using the CALSIM model), the basic changes in flow (patterns) that would likely cause differences in the aquatic habitat conditions for covered species are briefly previewed in this section.

ES.9.1.2 Changes in Minimum Required Delta Outflow

There are several rules governing Delta outflow. These include the minimum monthly outflows specified in D-1641 for each month, which often depend on the water year type (i.e., runoff conditions). These flow objectives were set to protect beneficial uses of Delta water for fish habitat. Delta outflow is also controlled by the maximum salinity objectives specified in D-1641 for each month or period. For example, salinity objectives are specified at certain Delta locations to protect agricultural diversions and drinking water supplies. Because Delta outflow is the major factor determining salinity within the Delta channels, these salinity objectives are satisfied by increasing Delta outflow. The Delta outflow required to meet these salinity objectives is included in the CALSIM model, so that all BDCP alternatives would meet these outflow and salinity objectives.

The spring X2 objectives introduced in the 1995 WQCP control Delta outflow in the months of February–June. X2, the location of the 2 parts per thousand (ppt) salinity isohaline (i.e., the upstream edge of the low salinity habitat zone), is specified on the basis of the (unimpaired) runoff in the previous month. This objective supports several estuarine species whose abundance has been correlated with X2. This was formulated as an adaptive objective; the required outflow increases with higher runoff conditions. All the BDCP alternatives include these same D-1641 outflow rules.

The 2008 USFWS BiOp included an outflow requirement for September, October, and November in wet (30% of years) and above normal (15% of years) water year types. The *Fall* X2 rule requires X2 (2 ppt salinity) to be at or downstream of Collinsville in above normal years and downstream of Chipps Island in wet years. The outflow would be greater and the exports would be less in these months with the Fall X2 requirement. The Fall X2 rule applies to the No Action Alternative and most of the BDCP alternatives. The Fall X2 rule was not included in the Existing Conditions and was not included in BDCP Alternatives 1A-C and 3.

1 **Table ES-10. Comparison of Operational Rules under BDCP Operational Scenarios and Alternatives**

| Operational Scenario Alternative | Applicable Months | Existing and No Action | Alt 1 | Alt 2 | Alt 3 | Alt 4 | Alt 5 | Alt 6 | Alt 7 | Alt 8 | Alt 9 |
|--|-------------------|------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------|--------------------|--------------------|--------|
| Delta Operational Rules for Maximum Allowable CVP and SWP South Delta Exports | | | | | | | | | | | |
| Limit for CVP (cfs) | Jan–Dec | 4,600 | 4,600 | 4,600 | 4,600 | 4,600 | 4,600 | 4,600 | 4,600 | 4,600 | 4,600 |
| Limit for SWP (10,300 cfs or 6,680 cfs plus 1/3 of SJR Dec 15–March 15) | Jan–Dec | 6,680+ | 10,300 | 10,300 | 10,300 | 10,300 | 10,300 | 10,300 | 10,300 | 10,300 | 6,680+ |
| Export/Inflow or Export/(Inflow–ND Intake) | Jan–Dec | Inflow | Inflow – ND Intake | Inflow – ND Intake | Inflow – ND Intake | Inflow – ND Intake | Inflow – ND Intake | 0 | Inflow – ND Intake | Inflow – ND Intake | Inflow |
| SJR Inflow/Export Ratio | Apr–May | X | 0 | 0 | 0 | 0 | X | 0 | X | X | 0 |
| Reverse Old and Middle River Flows | Dec–Jun | X | X | X | X | X | X | 0 | X | X | 0 |
| Delta Operational Rules for Minimum Required Delta Outflow | | | | | | | | | | | |
| D-1641 Objectives for Minimum Monthly Outflow, Maximum EC, and Feb–Jun X2 | Jan–Dec | X | X | X | X | X | X | X | X | X | X |
| 55% of unimpaired Runoff Objective | Feb–Jun | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | X | 0 |
| Maximum Fall X2 Location | Sep–Oct | X | 0 | X | 0 | X | X | X | X | X | X |
| New Operational Rules for Maximum North Delta Intake Diversions | | | | | | | | | | | |
| Maximum Capacity of North Delta Intakes (cfs) | Jan–Dec | None | 15,000 | 15,000 | 6,000 | 9,000 | 3,000 | 15,000 | 9,000 | 9,000 | None |
| Bypass Flows (% of Sacramento River at Freeport) | Jan–Dec | 0 | X | X | X | X | X | X | X | X | 0 |

Note:

“X” indicates that a BDCP alternative incorporates an operational rule.

“0” indicates that a BDCP alternative does not incorporate that operational rule.

The State Water Board has recently explored additional operational rules that would require Delta outflow to be a specified percentage of monthly unimpaired flow (California State Water Resources Control Board 2010). This rule would reduce the amount of runoff that could be stored in upstream reservoirs and would increase Delta outflow and reduce Delta exports in these months. BDCP Alternative 8 includes a monthly outflow of 55% of unimpaired runoff from February through June.

ES.9.1.3 Changes in Maximum Allowable Exports

Each alternative includes the CVP capacity of 4,600 cfs and assumes the existing south Delta SWP diversion capacity of 6,680 cfs plus 1/3 of the SJR flow from December 15 to March 15. SWP pumping to the maximum physical capacity of 10,300 cfs was assumed for BDCP alternatives that include north Delta intakes, but not for Alternative 9, which relies on south Delta pumping. The south Delta exports are limited to 35% of the Delta inflow in February–June and 65% of the Delta inflow in July–January. Delta inflow for the BDCP alternatives was assumed to be reduced by the north Delta diversions. However, the outflow requirements and the north Delta bypass flow rules generally prevent the basic E/I ratio from being exceeded for any of the BDCP alternatives. The 2009 NMFS BiOp SJR inflow/export ratio in April and May was applied to the south Delta exports for all BDCP alternatives except Alternative 9, which provides a separate corridor for the SJR flow that eliminates the entrainment of SJR fish in the CVP or SWP exports.

The limits on reverse OMR flows were applied to all BDCP alternatives except Alternative 6, which is an isolated facility that would divert all exports from the north Delta intakes. The limits on reverse OMR flow would also not apply to Alternative 9, because the SJR fish would be separated from exports by the Old River “corridor,” and Sacramento River water would be diverted through fish screens at DCC and Georgiana Slough to the Middle River “water supply corridor.” Entrainment of estuarine fish at south Delta pumping facilities would be eliminated because there would be no upstream flow from the lower SJR. Tidal transport of salt and fish from the low salinity habitat zone would be greatly reduced under Alternative 9. The OMR limits would vary each year with fish monitoring and turbidity conditions, as determined by the smelt working group. The north Delta diversions that are proposed for all BDCP action alternatives except Alternative 9 would allow these reverse OMR limits to be satisfied while diverting additional water from the Sacramento River. This is the major water supply benefit that would be achieved with the BDCP north Delta intakes and conveyance facilities.

ES.9.1.4 New Rules for North Delta Diversions

Fish protection at the proposed BDCP north Delta intakes would be provided by operational parameters that are related to maintaining seaward flow in the river and to continue the variability in flow that accompanies flow pulses, especially in key migratory months. Daily bypass flow rules were incorporated into the CALSIM modeling of each BDCP alternative. The bypass flow rule for July–September was assumed to be 5,000 cfs in all years for all BDCP alternatives except Alternative 9. During these months, Sacramento River flow above 5,000 cfs could be diverted at the north Delta intakes, subject to the minimum required Delta outflow. The minimum bypass flow in October and November was assumed to be 7,000 cfs in all years for all BDCP alternatives except Alternative 9.

The assumed bypass flow rules in December–June increase with the river inflow. Low-level pumping of 6% of the river flow would be allowed most of the time, but major diversions could not begin until the Sacramento River flow was greater than a specified threshold. The same bypass rules were

assumed for most of the BDCP alternatives. Alternatives 7 and 8 used slightly different bypass flow rules, and none were needed for Alternative 9, because the DCC and Georgiana Slough diversions are already limited to about 25% of the Sacramento River flow at Freeport.

Delta exports are sometimes limited by the storage capacity of San Luis Reservoir and seasonal (monthly) water supply deliveries that are assumed for south of Delta CVP and SWP contractors. The San Luis Reservoir provides about 2 million acre-feet (MAF) of seasonal storage for meeting the peak summer water demands. The San Luis Reservoir storage allows exports to continue through the fall and winter period. The BDCP action alternatives use the same CVP and SWP demands, but BDCP alternatives that allow higher exports may fill San Luis Reservoir earlier in some years and allow greater SWP Article 21 (interruptible) deliveries.

ES.9.1.5 Comparison of Flow Patterns for the BDCP Alternatives

The seasonal flow patterns calculated with the CALSIM monthly model for the BDCP alternatives are generally quite similar, because the inflow hydrology for the 82-year sequence (WY 1922–2003) are the same for each action alternative. Because there are no BDCP changes in the operation of the Trinity River Division, Trinity River diversions to the Sacramento River are identical for all the action alternatives. Similarly, because there are no BDCP-related changes in the San Joaquin River watershed, the SJR operations at Friant Dam and the reservoir operations on the SJR tributaries (i.e., Stanislaus, Tuolumne, and Merced Rivers) are identical for each of the BDCP alternatives. Finally, reservoir operations for each of the other tributaries (i.e., Yuba River, Mokelumne River, Cosumnes River, Calaveras River, Putah Creek, and Cache Creek) are unchanged for any of the BDCP alternatives. Therefore, the only flow changes are on the Sacramento, Feather, and American Rivers and in the Delta exports (north and south) and the Delta outflow.

All the BDCP alternatives include operable gates at the Fremont Weir to allow diversions into Yolo Bypass for floodplain inundation to provide improved rearing habitat for juvenile salmonids during November–May. Fremont Weir overtops when the combined flow of Sutter Bypass and the Sacramento and Feather Rivers surpasses 55,000 cfs as measured at Verona; flows through an operable gate could begin when Sacramento River flow at Verona is more than 23,100 cfs. The additional flows to the Yolo Bypass would be limited to 6,000 cfs and would reduce the Sacramento River flow at Freeport by this same amount. This shifting of Sacramento River flows into the Yolo Bypass was assumed for all the BDCP alternatives.

The north Delta intake diversions (Alternatives 1A through 8) would change the south Delta exports and the Delta outflows. Alternative 5 with a 3,000 cfs intake capacity would have the smallest effect on south Delta exports and would not substantially change outflow. Alternative 3 with a 6,000 cfs intake capacity would have a larger effect on reduced south Delta exports, and because Alternative 3 would not include the Fall X2 requirements, outflow would be reduced considerably from the No Action Alternative condition (which includes the Fall X2 requirements). Alternatives 4 (Scenario H1) and 7, both with a 9,000 cfs intake capacity, would shift about half the exports to the north Delta without changing the Delta outflow substantially. Under Alternative 4, CM1 includes two decision trees—one for fall outflow and one for spring outflow—that specify potential alternative outcomes for each criterion. Because each decision tree identifies two possible outcomes, the decision trees lay out four potential outcomes in initial outflow criteria when the spring and fall outflow components are combined. These four outcomes will be aggressively investigated through the decision tree process. Project operating criteria will be subject to a new determination by the permitting agencies, consistent with the adaptive management process for the BDCP, based on best

1 available science, specifying what the spring and fall outflow criteria will be at the time CM1
 2 operations begin¹⁷. The lower outflow scenario (H1) would allow 820 thousand acre-feet (TAF)/yr
 3 more exports than the No Action conditions, while the higher outflow scenario (H4) would allow
 4 about 25 TAF/yr less exports than the No Action conditions. Alternative 8, with 55% of unimpaired
 5 runoff required as outflow in February–June, would greatly increase outflow and reduce exports
 6 because the 9,000 cfs intake capacity would not be used as much as for Alternatives 4 and 7.
 7 Alternatives 1A–C and 2A–C each have a 15,000 cfs intake capacity but only about half the exports
 8 would be shifted from the south Delta. Delta outflow was reduced substantially for Alternatives 1A–
 9 C because the Fall X2 requirements were not included. Delta outflow was reduced slightly for
 10 Alternatives 2A–C in some months when the total exports were increased compared to the No
 11 Action Alternative condition. Alternatives 6A–C with a 15,000 cfs intake capacity would be operated
 12 as an isolated facility and would eliminate all pumping from the south Delta. However, because of
 13 the assumed bypass flow rules for the north Delta intakes, the total exports would be reduced.

14 Alternative 9 would fundamentally change the existing Delta channel flows. The SJR flow would be
 15 diverted into Old River (unless SJR flow is more than 10,000 cfs), would bypass the CVP and SWP
 16 south Delta pumping facilities, and would flow down the Old River channel to enter the estuary at
 17 the confluence near Collinsville. Estuarine fish from the low salinity zone would no longer be
 18 vulnerable to entrainment. Fish screens would be constructed at DCC and Georgiana Slough, so that
 19 DCC could be opened all the time to provide greater diversions from the Sacramento River to the
 20 Middle River water supply channel and the south Delta pumping facilities. The existing south Delta
 21 diversion capacity of 11,280 cfs was assumed for Alternative 9. The Delta outflow and exports were
 22 not substantially different from the No Action conditions.

23 The Delta water operations for the BDCP alternatives are compared on the basis of the change in
 24 Delta outflow (or the corresponding change in total exports) and by the fraction of the exports that
 25 are shifted to the north Delta intakes (to reduce entrainment of Sacramento River, San Joaquin
 26 River, and estuarine fish). Table ES-11 provides a summary for the No Action Alternative and nine
 27 BDCP alternative operational scenarios. Although there were some larger changes in monthly
 28 reservoir release flows or Delta outflows and exports, these annual average values show that the
 29 BDCP alternatives would result in only moderate changes in Delta outflow or south Delta exports.

¹⁷ This refers to the beginning of operations for the new north Delta facilities.

Table ES-11. Changes in Average Delta Outflow, Total Exports, and South Delta Pumping for the BDCP Alternatives for the Late Long-Term (2060)

| Alternative | North Delta Intake Capacity (cfs) | Major Feature(s) | Outflow (TAF/yr) | Delta Outflow Change (TAF/yr) | Total Exports (TAF/yr) | Total Exports Change (TAF/yr) | South Delta Exports (TAF/yr) | South Delta Exports Change (TAF/yr) |
|-------------|-----------------------------------|---|------------------|-------------------------------|------------------------|-------------------------------|------------------------------|-------------------------------------|
| No Action | 0 | | 16,400 | | 4,441 | | 4,441 | |
| Alt 1 | 15,000 | Five Intakes, No Fall X2 | 15,319 | -1,081 (-7%) | 5,459 | 1,025 (23%) | 2,742 | -1,692 (-38%) |
| Alt 2 | 15,000 | Five Intakes | 15,753 | -647 (-4%) | 5,070 | 636 (14%) | 2,126 | -2,308 (-52%) |
| Alt 3 | 6,000 | Two Intakes, No Fall X2 | 15,415 | -985 (-6%) | 5,372 | 938 (21%) | 3,501 | -933 (-21%) |
| Alt 4-H3 | 9,000 | Three Intakes, D-1641 Spring X2 and Fall X2 | 15,884 | -516 (-3%) | 4,946 | 505 (11%) | 2,510 | -1,931 (-44%) |
| Alt 4-H1 | 9,000 | D-1641 Spring X2 and D-1641 Fall Out low | 15,418 | -982 (-6%) | 5,255 | 821 (18%) | 2,792 | -1,649 (-37%) |
| Alt 4-H2 | 9,000 | Higher Spring Outflow and D-1641 Fall outflow | 15,937 | -463 (-3%) | 4,710 | 269 (6%) | 2,561 | -1,880 (-42%) |
| Alt 4-H4 | 9,000 | Higher Spring Outflow and Fall X2 | 16,277 | -123 (<1%) | 4,414 | -27 (<1%) | 2,270 | -2,171 (-49%) |
| Alt 5 | 3,000 | One Intake | 16,053 | -347 (-2%) | 4,780 | 346 (8%) | 3,588 | -846 (-19%) |
| Alt 6 | 15,000 | Five Intakes, Isolated-No SD Pumping | 17,025 | 625 (4%) | 3,763 | -671 (-15%) | 0 | -4,434 (-100%) |
| Alt 7 | 9,000 | Three Intakes, More restrictive OMR and SJR/Export Limits | 17,083 | 683 (4%) | 3,752 | -682 (-15%) | 1,404 | -3,030 (-68%) |
| Alt 8 | 9,000 | Three Intakes, February-June Outflow >55% Unimpaired Runoff | 17,847 | 1,447 (9%) | 3,105 | -1,329 (-30%) | 912 | -3,522 (-79%) |
| Alt 9 | 0 | SJR Separated, Fish Screens on DCC and Georgiana Slough | 16,464 | 64 (<1%) | 4,365 | -69 (<1%) | 4,365 | -69 (<1%) |

ES.9.2 Land-Based Resources and Impact Mechanisms

As described in Section ES.5, *Alternatives Considered in the EIR/EIS*, the alternatives differ primarily in their physical conveyance facility infrastructure and alignments, the locations of facilities, and diversion capacities (ranging from 3,000 to 15,000 cfs). Other differences between alternatives are associated with operational criteria for water supply facilities and the amounts and types of habitat restoration and enhancement proposed. These basic differences between alternatives would generally influence the extent or degree of impacts on land-based resources. Under the No Action Alternative, there would be no BDCP-related impacts on land-based resources.

For land-based resources (e.g., agricultural resources, terrestrial biological resources, cultural resources, hazards and hazardous materials, public services and utilities), those alternatives that would result in the greatest land disturbances would also result in more extensive or greater impacts, in general. Those BDCP action alternatives that include the construction of large canals for water conveyance under CM1 (Alternatives 1B, 1C, 2B, 2C, 6B, and 6C) would have greater impacts on land-based resources due to the potential loss of habitat; disturbance/destruction of cultural resources; interference with or loss of recreational opportunities; loss of agricultural resources; and impairment of public services and utilities, for example, compared with alternatives that would rely on pipelines/tunnels to convey water underground (Alternatives 1A, 2A, 3, 4, 5, 7, and 8). The canal alignment alternatives would also bisect existing floodplains, agricultural drainage systems, surface irrigation systems, and underground utilities. Although the construction of north Delta intakes, an intermediate forebay, and tunnel facilities would likely result in some of these types of land-based impacts, the extent of the disturbed acreage would be only a fraction of what would occur with the construction of surface conveyance canals.

Further, alternatives with fewer intakes (Alternatives 3, 4, 5, 7, and 8 contrasted with Alternatives 1A–1C, 2A–2C, and 6A–6C) would result decreases in some kinds of impacts: for example, less land disturbance and thus potentially less noise and visual disturbances for recreationists; fewer incompatibilities with existing land uses; and fewer vehicles associated with construction activities on existing roadways. Additionally, alternatives with a westside canal alignment (1C, 2C, and 6C) would be more susceptible to earthquake damage and would be more difficult to construct than the eastside canals (1B, 2B, and 6B) due to geologic conditions. Alternatives with tunnels would also be less susceptible than alternatives with canals to liquefaction, seepage, settlement, and damage resulting from seismic events, wave run-up, and erosion during a flood event. Although the construction and operation of a large-scale water conveyance facility would not occur under the No Action Alternative, projects would be constructed and operated that would result in temporary and permanent impacts on land-based resources such as agriculture, aesthetics, recreation, and terrestrial habitat and species. However, it is unlikely that any single project under this alternative would result in impacts on land-based resources that are similar in magnitude and geographical extent to those of any BDCP action alternative.

Alternative 9, a “through-Delta” proposal, which would provide an isolated corridor for fish passage through the San Joaquin River system in lieu of new north Delta intakes, presents a unique set of environmental issues. Alternative 9 would use sensitive natural channels in the Delta to transport water and would require increased construction in riparian areas along the banks of the Mokelumne and San Joaquin Rivers, compared to the other alternatives that would require construction primarily along the Sacramento River, which is already heavily riprapped. Alternative 9 would result in increased visual and recreation impacts in certain areas compared to other alternatives associated with the construction of 14 operable barriers, necessary for fish and water quality

protection purposes; these barriers would substantially change the visual character of the Mokelumne and San Joaquin Rivers and would adversely affect recreational boating opportunities. This alternative combines various in-Delta improvements compared to the No Action Alternative.

As described in Section ES.5, *Alternatives Considered in the EIR/EIS*, CM2–CM22 are the same for all action alternatives with the exception of Alternatives 5 and 7. Relative to the other action alternatives, Alternative 5 would restore 40,000 fewer acres of tidal habitat, and Alternative 7 would restore an additional 10,000 acres of seasonally inundated floodplain, and would enhance 20 additional linear miles of channel margin habitat. Therefore, under Alternative 7, there would be potentially more or greater temporary (construction-related) and/or permanent impacts on many land-based resources, such as aesthetics, public services and utilities, land use, and public health, depending on the locations chosen to implement these restoration/enhancement actions. Because Alternative 5 would restore substantially fewer acres of tidal habitat, temporary and/or permanent impacts on land-based resources such as agriculture, land use, terrestrial biological resources would generally be less than those under the other action alternatives. For example, under Alternative 5, there would be reduced conversion of managed wetlands and cultivated lands. However, Alternative 5 would also offer fewer benefits to those terrestrial species that are restricted to tidal wetlands. Under the No Action Alternative, although some future projects and programs would implement habitat restoration in the Plan Area, such as implementation of certain reasonable and prudent alternatives (RPAs) as required by the 2008 and 2009 BiOps issued by NMFS and USFWS, it is unlikely that the magnitude of habitat restoration, creation, and enhancement would exceed that implemented under any of the action alternatives. Consequently, temporary and/or permanent impacts on land-based resources due to these activities would likely be less under the No Action Alternative. However, for this same reason, the extent of potential benefits to certain land-based resources, such as certain terrestrial species, would also likely be less under the No Action Alternative than under the action alternatives because there would likely be less riparian and grassland natural community restoration, for example.

ES.9.3 Air-Based Resources and Impact Mechanisms

Air-based resources (e.g., criteria pollutants, toxic air containments [TACs], and greenhouse gases [GHG]) are primarily influenced by construction and operational activities associated with CM1. Pollutant emissions generated by construction of the BDCP action alternatives would vary depending on the total amount of disturbed area, the duration and location of construction, and the intensity of construction activities. Criteria pollutants and TACs generated by long-term operation of the water conveyance facility would be similar among all alternatives, whereas GHG emissions generated by electricity generation would differ based on water supply criteria of the specific alternatives.

Those alternatives that would require the most construction activities would result in more extensive air quality impacts. With respect to criteria pollutants and TACs, the pipeline/tunnel alternatives (1A, 2A, 3, 5, 6A, 7, and 8) and modified pipeline/tunnel alternative (4) have the greatest potential to result in short-term effects on ambient air quality in Sacramento County. Alternatives 1A, 2A, and 6A, which would construct five intakes and pumping plants, would generate the highest emissions of the pipeline/tunnel alternatives. While the pipeline/tunnel alternatives would generate substantial criteria pollutants and TACs in Sacramento County, emissions generated in San Joaquin and Contra Costa Counties would be minimized by use of electric tunnel boring machines.

The east alignment alternatives (1B, 2C, 6C) that include the construction of large canals for water conveyance would have the greatest potential to result in short-term effects on ambient air quality in San Joaquin County. These alternatives would also generate TAC concentrations that would exceed local air district thresholds and potentially expose sensitive receptors to substantial pollutant concentrations. The west alignment alternatives (1C, 2C, 6C) do not include any construction activity in San Joaquin County, but would generate the highest emissions levels of all BDCP action alternatives within Yolo and Contra Costa Counties. Construction activities associated with Alternative 9 are spatially diverse and spread throughout Sacramento, San Joaquin, and Contra Costa Counties.

The BDCP action alternatives that require extensive tunnel boring and concrete batching activities have the greatest potential to adversely affect climate change (i.e., contribute to elevated GHG concentrations in the atmosphere). Accordingly, the pipeline/tunnel and modified pipeline/tunnel alternatives would generate the most GHG emissions of the four alignments. The west alignment alternatives, followed by the east alignment alternatives and Alternative 9, would generate the next highest emissions, respectively.

Facilities under construction as of February 13, 2009, would result in short-term criteria pollutant, TAC, and GHG emissions from land disturbance and the use of heavy-duty equipment under the No Action Alternative. Construction emissions associated with these projects would result in an adverse effect if the incremental difference, or increase, relative to Existing Conditions exceeds applicable air district or federal de minimis thresholds. However, it is unlikely that any single project under the No Action Alternative would result in impacts on air quality that are similar in magnitude and geographical extent to those of any BDCP action alternatives. Moreover, all projects would be required to comply with air district rules and regulations governing construction-related criteria pollutant and GHG emissions.

None of the BDCP action alternatives would result in adverse effects on air quality from long-term operation of the water conveyance facility. Alternatives 1A, 1B, 1C, 2A, 2B, 2C, and 3 would result in a net increase in GHG emissions relative to Existing Conditions and the No Action Alternative. Alternatives 4 and 5 could result in a net increase or decrease in GHG emissions, depending on the analysis condition (2025 or 2060) and pumping scenario. GHG emissions generated by increased electricity consumption for pumping would be addressed through modifications to DWR's Renewable Energy Procurement Plan (REPP). Alternatives 6A through 9 would result in a net reduction in electricity demand and associated GHG emissions.

Habitat restoration and enhancement conservation measures (CM2–CM22) are anticipated to include a number of activities that could generate traffic and require earthmoving equipment. Criteria pollutant, TAC, and GHG emissions generated by implementation of CM2–CM22 would be the same for all BDCP action alternatives. Emissions could result in adverse impacts on air quality if the incremental difference, or increase, relative to Existing Conditions exceeds the applicable local air district thresholds. Changes in carbon flux associated with restoration and enhancement activities are expected to result in a beneficial impact on GHG emissions. However, without information on site-specific characteristics associated with each of the restoration components, a complete assessment of GHG flux from CM2–CM11 is currently not possible.

ES.10 References Cited

- BDCP Steering Committee. 2007. *Conservation Strategy Options Evaluation Report*. September 17. Prepared by Science Applications International Corporation. Sacramento, CA. Available: <http://baydeltaconservationplan.com/Libraries/Dynamic_Document_Library/App_3A_Att03_ConsStrat.sflb.ashx>. Accessed: June 12, 2013.
- California State Water Resources Control Board. 2010. *Development of Flow Criteria for the Sacramento–San Joaquin Delta Ecosystem*. Prepared Pursuant to the Sacramento–San Joaquin Delta Reform Act of 2009. Sacramento, CA. Available: <http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/delta_low/docs/final_rpt080310.pdf>. Accessed: June 12, 2013.
- Delta Protection Commission. 1995. *Land Use and Resource Management Plan for the Primary Zone of the Delta*. Adopted February 23, 1995. Reprinted May 2002. Walnut Grove, CA.
- National Marine Fisheries Service. 2009. *Biological and Conference Opinion on the Long-Term Operations of the Central Valley Project and State Water Project*. June 4. Long Beach, CA. Available: <http://www.swr.noaa.gov/ocap/NMFS_Biological_and_Conference_Opinion_on_the_Long-Term_Operations_of_the_CVP_and_SWP.pdf>. Accessed: June 12, 2013.
- U.S. Bureau of Reclamation. 2008. *Biological Assessment on the Continued Long-term Operations of the Central Valley Project and the State Water Project*. Sacramento, CA: Mid-Pacific Region.
- U.S. Fish and Wildlife Service 2008. *Biological Opinion on the Effects of Long Term Coordinated Operations of the Central Valley (CVP) and State Water Project (SWP) on Delta Smelt and its Designated Critical Habitat*. December.